

[09/10/26]

TO: PLAN HOLDERS LIST

SUBJECT: PROCUREMENT NO. 072026-1051
ARKEMA INTERIM ACTION-PHASE 1

ADDENDUM NUMBER 05

A substitution request was submitted and approved to use LLDPE in the Permanent Containment Wall Protective Cap. This addendum is issued to amend the following:

Drawing G1.0:

Revised Sheet Title of C1.8 to Liner System Plan, deleted PVC specific reference to incorporate substitution request for LLDPE.

Drawing G1.1:

Revised hatch label to Liner System, deleted PVC reference to incorporate substitution request for LLDPE.

Drawing C1.8:

Various revisions to delete change PVC Liner to Liner, drawing language modified to incorporate substitution request for LLDPE.

Drawing C1.9:

Revised sheet notes and callouts to allow PVC or LLDPE liner systems to incorporate substitution request for LLDPE.

Drawing C1.10:

Revised sheet notes and callouts to allow PVC or LLDPE liner systems to incorporate substitution request for LLDPE.

00 01 15 – List of Drawing Sheets:

Revised Sheet Title of C1.8 to Liner System Plan, deleted PVC specific reference to incorporate substitution request for LLDPE.

00 11 13 – Advertisement for Bids:

Deleted PVC in reference to the liner system.

00 45 13 – Responsibility Detail Form:

Revised checklist to say "If any answer to questions through 6 is "No".

00 73 16 – Insurance Requirements:

Removed requirement for Technology Professional Liability Errors and Omissions Insurance.
Deleted Section 00 73 16 1.03.D.5

01 10 00 – Summary:

Deleted PVC in reference to the liner system.

01 20 00 – Measurement and Payment:

Deleted PVC in reference to the liner system.

31 20 00 – Earthwork:

Multiple revisions to specification to allow for LLDPE substitution request.

1.01.7. Deleted PVC

1.04.G. Revised to include LLDPE

2.02.B.1. Revised language to include LLDPE

2.02.F. Added new sub-section for LLDPE liner product specifications

3.02.4. Revised language to allow for barge supported equipment. This added language corrects Addendum 1. The revised 31 20 00 section was not attached to the issued Addendum 1 and the corrected language was not shown in Addendum 3 or Addendum 4.

3.04.D. Deleted PVC and changed reference to Liner system

3.18 Entire section revised to include LLDPE liner system

PORT OF TACOMA

ARKEMA INTERIM ACTION - PHASE 1

CONTRACT NO. PA000000403

PROJECT NO. 101585.01

PORT COMMISSIONERS:

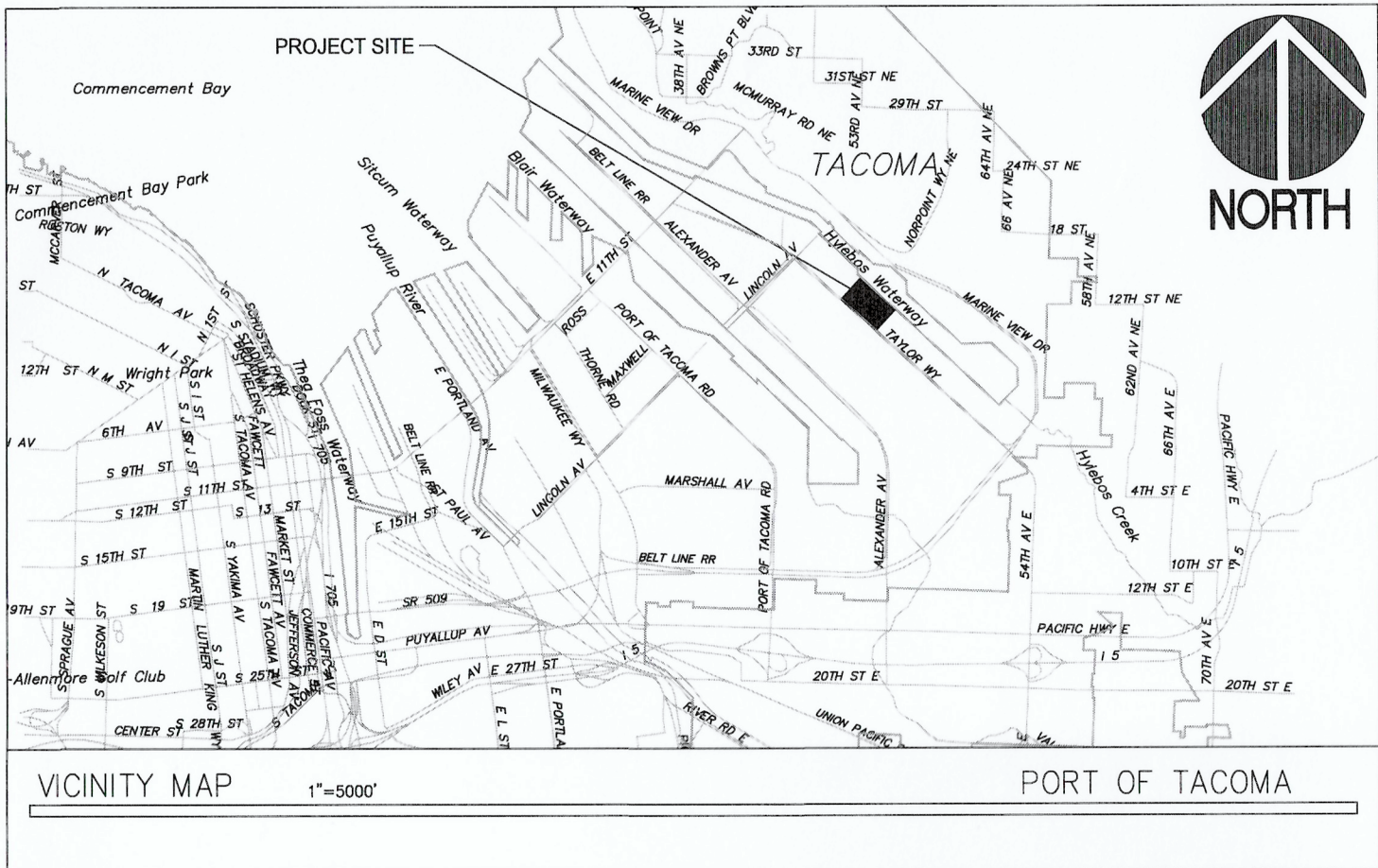
RICHARD P. MARZANO
JT WILCOX
JOHN MCCARTHY
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DEANNA KELLER

PORT STAFF:

ERIC JOHNSON
Port of Tacoma Executive Director

THAIS HOWARD, P.E.
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Project Manager



CONSULTANT:

DOF

DALTON
OLMSTED
FUGLEVAND

2601 Cherry Ave., Ste 300
Bremerton, WA 98310

PROJECT ENGINEER: TREVOR LOUVIERE

DRAWING LIST			
SHEET DESIGNATION	SHEET #	SHEET TITLE	REVISION
G1.0	1	Cover Sheet	5
G1.1	2	General Notes, Legend and Abbreviations	5
SV1.0	3	Topographic Survey	0
SV1.2	4	Topographic Survey - Area 2	0
SV1.3	5	Topographic Survey - Area 3	0
SV1.4	6	Topographic Survey - Area 4	0
SV1.5	7	Topographic Survey - Area 5	0
SV1.6	8	Topographic Survey - Area 6	0
SV1.7	9	Topographic Survey - Area 7	0
D1.0	10	Temporary Erosion and Sediment Control (TESC) Plan	0
D1.1	11	TESC Details	0
D2.0	12	Clearing and Grubbing	0
D3.0	13	Demolition Plan	1
D3.1	14	Existing Conditions - Subsurface Utilities 1	0
D3.2	15	Existing Conditions - Subsurface Utilities 2	0
D3.3	16	Existing Conditions - Subsurface Utilities 3	0
D3.4	17	Existing Conditions - Subsurface Utilities 4	0
C1.0	18	Containment Wall Alignment Plan	0
C1.1	19	Preload Plan and Detail	0
C1.2	20	Preload Profile 1 (STA 0+00 to 13+75)	0
C1.3	21	Preload Profile 2 (STA 13+75 to 21+68.8)	0
C1.4	22	Pre-Cap Grading Plan	0
C1.5	23	Stormwater Diversion Berm Construction	0
C1.6	24	Containment Wall Profile 1 (STA 0+00 to 11+00)	0
C1.7	25	Containment Wall Profile 2 (STA 11+00 to 21+68.80)	0
C1.8	26	Liner System Plan	5
C1.9	27	Final Restoration Contours	5
C1.10	28	Containment Wall Details	5
C1.11	29	Final Restoration Cross Sections	0
C2.0	30	Overall Grading and Drainage Plan	0
C2.4	31	Grading and Drainage Plan - Area 4	0
C2.5	32	Grading and Drainage Plan - Area 5	0
C2.6	33	Grading and Drainage Plan - Area 6	0
C2.7	34	Grading and Drainage Plan - Area 7	0
C2.9	35	Storm Drainage Notes and Details	0
C2.10	36	Treatment Vault Details 1	2
C2.11	37	Treatment Vault Details 2	0
C2.12	38	Outfall Profiles	0
C2.13	39	Structural Notes and Typical Details	1
C2.14	40	North Outfall Notes and Details	0
C2.15	41	South Outfall Notes and Details	0
C2.16	42	Storm Drain Profiles	0
C2.19	43	Storm Drain Profiles	0
C2.25	44	Storm Drainage Details	2

6697

G1.0

SH #1 OF #44

CONT/CONS: PA000000403 TOWNSHIP: 21N RANGE: 3E SECTION: 36
M. ID: 101585.01 DAT-HRZ: WA83/2011 VERT: MLLW 15.73' @ POT MON #178
PHASE: FOR BID PARCEL: 0321351053 DRAWING SCALE: AS NOTED

ARKEMA INTERIM ACTION - PHASE 1
CONTAINMENT WALL
COVER SHEET

DOF

DALTON
OLMSTED
FUGLEVAND

2601 Cherry Ave., Ste 300
Bremerton, WA 98310

PROJECT ENGINEER: TREVOR LOUVIERE

Port of Tacoma

P.O. BOX 1837 TACOMA, WA 98401-1837

APPROVED:

CHECKED BY: TLOUVIERE 07/29/26
DIRECTOR: Eric Johnson
PRINTED BY: thegeley Sep 09, 2026
PORT ADDRESS: ONE SITCOM PLAZA
TACOMA, WA 98401-1837

R. WEBB 07/29/26

REVISION:

MARK: /S/

REVISION: Addendum 5

BY: TL

DATE: 9/9/2026

GENERAL PROJECT NOTES

1. THE LOCATIONS OF ALL UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXISTING UTILITY LOCATIONS PRIOR TO SUBSURFACE WORK. TO LOCATE UTILITIES, CALL THE UNDERGROUND LOCATE LINE AT 1-811-424-5555 OR 811. UTILITIES IDENTIFIED ON SHEETS D3.1 THROUGH D3.4 WERE IDENTIFIED DURING SHALLOW TRENCHING UTILITY INVESTIGATION WORK ALONG THE CONTAINMENT WALL ALIGNMENT AS PART OF THE PRE-DESIGN INVESTIGATION FIELD WORK. TRENCHING DEPTHS RANGED FROM THREE TO FOUR FEET BELOW GROUND SURFACE. UTILITIES MAY BE PRESENT BELOW THESE DEPTHS.
2. WHERE CONFLICTS OCCUR BETWEEN EXISTING FEATURES AND THE PLACEMENT OF NEW FACILITIES, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BY THE CONTRACTOR, AND WILL BE RESOLVED BY THE ENGINEER.
3. CONTRACTOR IS WARNED THAT SITE SOIL AND GROUNDWATER IS IMPACTED WITH ARSENIC AT LEVELS CONSIDERED HAZARDOUS. SUCH MATERIALS, WHEN ENCOUNTERED, SHALL BE HANDLED APPROPRIATELY IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS.

PRE-CONSTRUCTION SUBMITTALS

1. CONTRACTOR SHALL SUBMIT WORK PLAN DISCUSSING TEMPORARY EROSION AND SEDIMENT CONTROLS (TESC), HAZARDOUS MATERIAL HANDLING DESCRIPTIONS, PROJECT APPROACH, SEQUENCING (IF APPROPRIATE), SCHEDULE, ANY SUBCONTRACTORS, EQUIPMENT TO BE USED, AND OTHER RELEVANT INFORMATION TO COMPLETE THE WORK DESCRIBED IN THE PROJECT DOCUMENTS.
2. PROVIDE THE SOURCE OF BORROW MATERIAL AND SAMPLES FOR CHEMICAL ANALYSIS IN ACCORDANCE WITH APPENDIX A (INTERIM ACTION WORK PLAN), SUB-APPENDIX I AT LEAST THREE WEEKS PRIOR TO IMPORT TO THE SITE. BORROW MATERIALS MUST NOT EXCEED LEVELS SET FORTH IN THE ABOVE REFERENCED APPENDIX.
3. ALL PRE-CONSTRUCTION SUBMITTALS REQUIRED IN THE SPECIFICATIONS.

CONSTRUCTION SUBMITTALS

1. CHAIN OF CUSTODY AND LABORATORY RESULTS FOR SAMPLES COLLECTED, THESE INCLUDE BUT ARE NOT LIMITED TO, PERSONAL MONITORING SAMPLES, MATERIAL TESTING RESULTS, ETC.
2. VENDOR SPECIFICATION SHEETS AND SHOP DRAWINGS FOR MATERIALS AND PRODUCTS RELATED TO THE PROJECT.
3. ALL CONSTRUCTION SUBMITTALS REQUIRED IN THE SPECIFICATIONS.

POST-CONSTRUCTION SUBMITTALS

1. ANY DOCUMENTATION ON THE PROJECT THAT WAS NOT PREVIOUSLY SUBMITTED, E.G. TRUCK SCALE TICKETS FOR IMPORTED MATERIALS.
2. ALL POST-CONSTRUCTION SUBMITTALS REQUIRED IN THE SPECIFICATIONS.

SURVEY NOTES - SEE SHEET G2.0

1. SITE SURVEY TITLED "EXISTING TOPOGRAPHIC SURVEY FOR: PORT OF TACOMA", COMPLETED BY SITTS & HILL ENGINEERING & SURVEYING, INC., 4815 CENTER ST, TACOMA WA 98409 DATED APRIL 4, 2024.
2. COORDINATES ARE REFERENCED TO WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.
3. ELEVATIONS SHOWN ARE REFERENCED TO MLLW.
4. SURVEY BENCHMARKS:
HORIZONTAL DATUM
P.O.T. MONUMENT #178
DESCRIPTION: LEAD AND TACK FOUND IN THE NORTHEAST GUTTER OF TAYLOR WAY.
PUBLISHED COORDINATES
N:709882.76
E:1175405.11

- P.O.T. MONUMENT #DD'
DESCRIPTION: 3" SURFACE BRASS MONUMENT WITH PUNCH AND "TACOMA PUBLIC WORKS" FOUND IN CENTERLINE OF LINCOLN AVE, APPROX. 260' SOUTHWEST OF CENTERLINE INTERSECTION WITH TAYLOR WAY.
PUBLISHED COORDINATES
N:712137.47
E:1172517.33

- VERTICAL DATUM
MLLW (PER PORT OF TACOMA SURVEY CONTROL MAP, DATED 2016)

- P.O.T. MONUMENT #178
DESCRIPTION: LEAD AND TACK FOUND IN THE NORTHEAST GUTTER OF TAYLOR WAY.
PUBLISHED COORDINATES
N:709882.76
E:1175405.11
MLLW ELEV.: 15.73
TO CONVERT TO NGVD29 VALUES, REDUCE ALL ELEVATIONS BY 5.96 FEET (-5.96)
TO CONVERT TO NAVD88 VALUES, REDUCE ALL ELEVATIONS BY 2.46 FEET (-2.46)

5. THE CONTRACTOR SHALL CAREFULLY PRESERVE ALL BENCH MARKS, PROPERTY LINE REFERENCES (E.G., PINS, PIPES, MONUMENTS), REFERENCE POINTS, STAKES AND ANY OTHER SURVEY REFERENCE.
6. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY SURVEY MONUMENTS NOTED OR ENCOUNTERED IN THE FIELD. ANY DISTURBANCE SHALL BE REPAIRED BY CONTRACTOR AT NO EXPENSE TO THE OWNER OR ENGINEER. STANDARDS OF PRACTICE REQUIRE THAT "THE HORIZONTAL POSITION OF PHYSICAL FEATURES MUST BE PLOTTED TO 1/20TH INCH OF FINAL MAP SCALE". DIMENSIONS "SNAPPED" FROM THE ELECTRONIC VERSION OF THIS MAP SHOULD BE CONSIDERED TO BE NO MORE ACCURATE THAN 1/20TH OF THE MAP SCALE NOTED. CRITICAL CLEARANCE DIMENSIONS MUST BE FIELD CHECKED.

- TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) NOTES
SEE SHEET D1.0

- ACRONYM LIST
TESC Temporary Erosion and Sedimentation Control
CESCL Certified Erosion and Sediment Control Lead
CPESC Certified Professional in Erosion and Sediment Control
ESC Erosion and Sediment Control
CPP Corrugated Polyethylene Pipe
TV Temporary Vault
IAWP Interim Action Work Plan
SWPPP Stormwater Pollution and Prevention Plan
WSDOT Washington State Department of Transportation
TPN Tax Parcel Number
BPM Best Management Practice
TP Turning Point
TD Total Depth
N Blow Count
bgs Below Ground Surface
HASP Health and Safety Plan
PVC Polyvinyl Chloride
SDS Safety Data Sheet

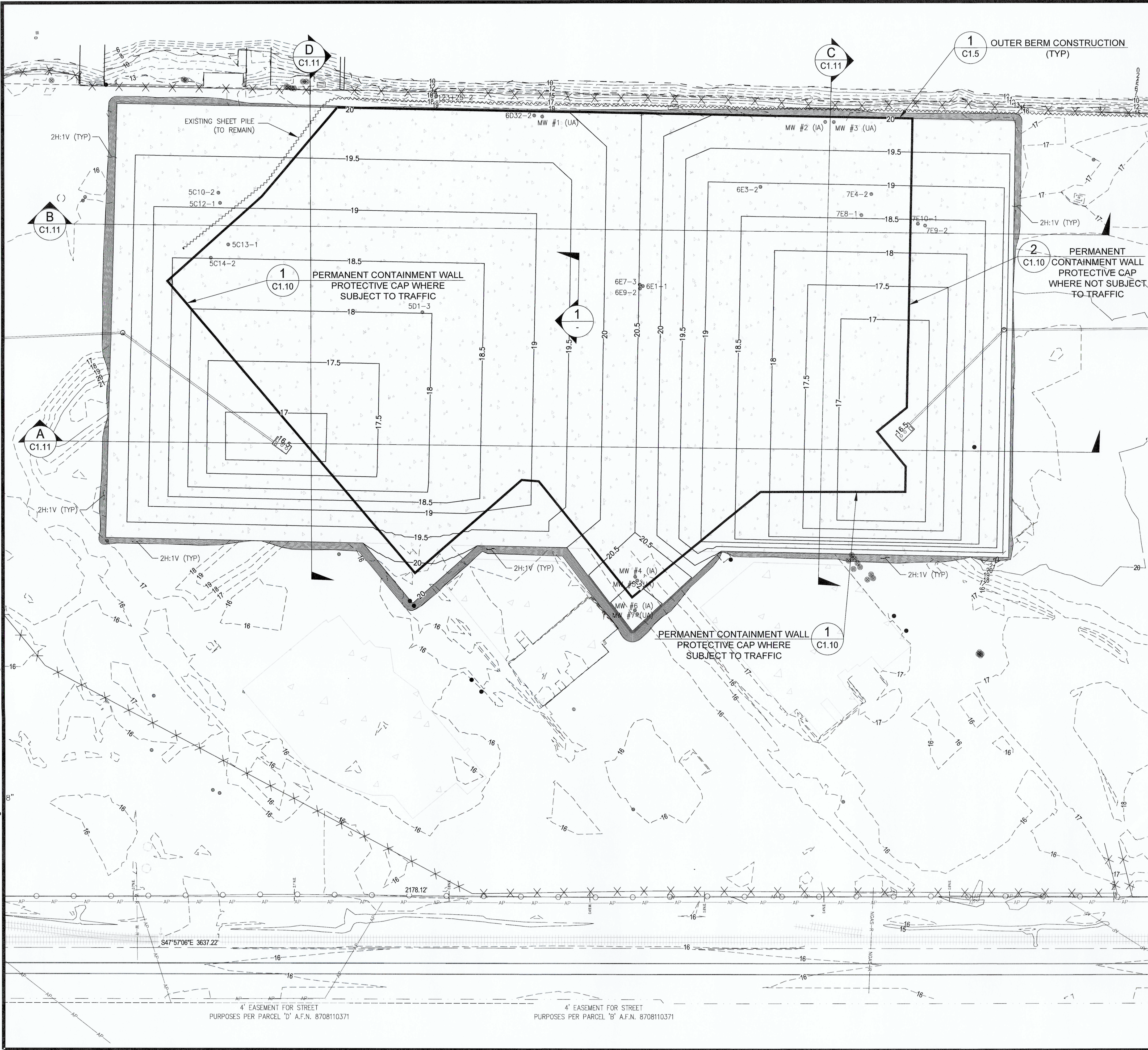
LEGEND

○	⊗	FOUND MONUMENT/ REBAR AS NOTED	———	PARCEL LINE		ASPHALT SURFACE
×	×	SURVEY CONTROL POINT	———	ROAD CENTERLINE		CONCRETE SURFACE
⊗	⊗	SANITARY SEWER MANHOLE	———	RIGHT OF WAY LINE		GRAVEL SURFACE
○	○	UTILITY CLEAN OUT	-----	EASEMENT LINE		RIP-RAP SURFACE
⊗	⊗	STORM MANHOLE	——SD——	STORM DRAIN LINE		WETLAND AREA
⊗	⊗	STORM CATCH BASIN	——SD-R——	RECORD STORM LINE		EASEMENT
—	—	STORM CULVERT	——SS——	SANITARY SEWER LINE		5/8-MINUS CRUSHED ROCK
⊗	⊗	WATER MANHOLE	——SS-R——	RECORD SANITARY LINE		GRASS
—	—	WATER VALVE	——W——W——	BURIED WATER LINE		TO BE DEMOLISHED
⊗	⊗	WATER METER	——W-R——	RECORD WATER LINE		
⊗	⊗	FIRE HYDRANT	——NGAS-R——	BURIED GAS LINE		
⊗	⊗	IRRIGATION CONTROL VALVE	——BP——	RECORD GAS LINE		
⊗	⊗	GAS VALVE	——BP-R——	RECORD BURIED POWER		
⊗	⊗	GAS RISER	——AP——	OVERHEAD POWER LINE		
⊗	⊗	POWER METER	——BT——	BURIED TELECOM LINE		
⊗	⊗	POWER CABINET	——BT-R——	RECORD TELECOM LINE		
⊗	⊗	UTILITY POLE	——O——	CHAIN LINK FENCE		
⊗	⊗	UTILITY POLE WITH DROP(S)	——	RAILROAD TRACKS		
⊗	⊗	GUY ANCHOR	——	WETLAND DELINEATION		
⊗	⊗	JUNCTION BOX	——	2004 POND MAPPING LIMITS		
⊗	⊗	POWER VAULT	——	SHEARWALL/SHEET PILE WALL PER 2004 MAPPING		
⊗	⊗	LIGHT POLE	——	DIRECT PUSH BORING LOCATION		
⊗	⊗	TELECOM RISER	——	HOLLOW-STEM AUGER BORING LOCATION		
⊗	⊗	TELECOM VAULT	——	TURNING POINT LOCATION		
⊗	⊗	TELECOM JUNCTION BOX	——	CONTAINMENT WALL ALIGNMENT		
⊗	⊗	UTILITY VAULT	——	CONTAINMENT WALL ALIGNMENT STATIONING		
⊗	⊗	UTILITY MANHOLE	——	PARCEL BOUNDARY		
⊗	⊗	UNKNOWN STAND PIPE	——	EXISTING SHEET PILE WALL		
⊗	⊗	UNKNOWN VALVE	——	EXISTING FENCE		
⊗	⊗	UNKNOWN RISER	——	MAJOR ELEVATION CONTOUR (5' INTERVAL)		
⊗	⊗	COLUMN	——	MINOR ELEVATION CONTOUR (1' INTERVAL)		
⊗	⊗	BOLLARD	——	PROPOSED CONTOUR		
⊗	⊗	SIGN	——	SLOPE		
⊗	⊗	MAILBOX	——	SAMPLE INTERVAL AND DEPTH		
⊗	⊗	ECOLOGY BLOCK	——	APPROXIMATE BOTTOM OF CONTAINMENT WALL		
⊗	⊗	RAILROAD SWITCH	——	BORING LOCATION		
⊗	⊗	MONITORING WELL	——			
⊗	⊗	PILE	——			
⊗	⊗	WETLAND FLAG	——			
⊗	⊗	TAX PARCEL NUMBER	——			
⊗	⊗	DISTANCE AND DIRECTION OF NOTED OBJECT FROM PROPERTY LINE	——			
⊗	⊗	SCHED. B EXCEPTION NUMBER	——			

CONTAINMENT WALL PROFILES LEGEND

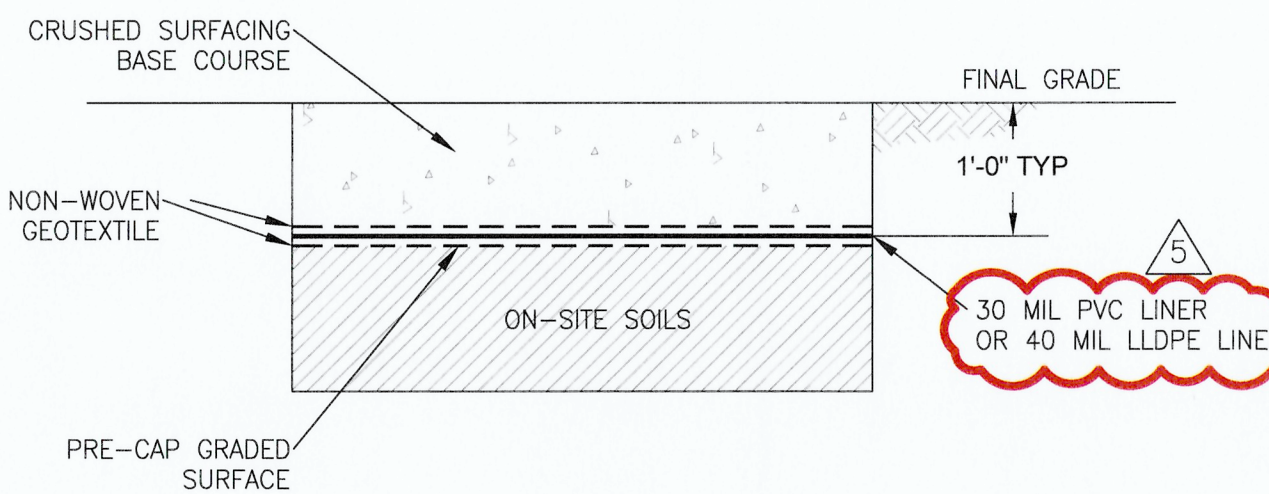
	UPPER AQUIFER
	FIRST AQUITARD
	INTERMEDIATE AQUIFER
	SECOND AQUITARD
	DEEP AQUIFER

6697 G1.1 SH #2 OF #44	ARKEMA INTERIM ACTION - PHASE 1 CONTAINMENT WALL GENERAL NOTES, LEGEND, AND ABBREVIATIONS	APPROVED: T. LOUVIERE DIRECTOR ENG. DATE: 07/29/26	R. WEBB 07/29/26 CHECKED BY DATE T. LOUVIERE 07/29/26 PROJ. ENGR. DATE PRINTED BY: kbedley Sep 09, 2026 PORT ADDRESS: ONE SITCUM PLAZA TACOMA, WA 98401-1837	CONT/CONS: PA00000403 M. ID: 101585.01 PHASE: FOR BID	TOWNSHIP: 21N RANGE: 3E SECTION: 36 MLLW 15.73' @ POT MON #178 WAB3/2011 0321351053 DRAWING SCALE: AS NOTED	DATE: 9/9/2026 APPR: TL BY: TL REVISION: Addendum 5	Port of Tacoma P.O. BOX 4837 TACOMA, WA 98401 (253) 894-5841



LEGEND

- SANITARY SEWER MANHOLE
- UTILITY CLEAN OUT
- STORM MANHOLE
- STORM CATCH BASIN
- STORM CULVERT
- WATER MANHOLE
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- GAS VALVE
- GAS RISER
- POWER METER
- POWER CABINET
- UTILITY POLE
- UTILITY POLE WITH DROP(S)
- GUY ANCHOR
- JUNCTION BOX
- POWER VAULT
- LIGHT POLE
- COLUMN
- BOLLARD
- RAILROAD SWITCH
- MONITORING WELL
- DISTANCE AND DIRECTION OF NOTED OBJECT FROM PROPERTY LINE
- PARCEL LINE
- ROAD CENTERLINE
- RIGHT OF WAY LINE
- AP — OVERHEAD POWER LINE
- CHAIN LINK FENCE
- RAILROAD TRACKS
- WETLAND DELINEATION
- SHEARWALL/SHEET PILE WALL PER 2004 MAPPING
- WETLAND AREA
- EASEMENT
- CRUSHED ROCK BASE COURSE
- CONCRETE SURFACE
- CONTAINMENT WALL ALIGNMENT
- PROPOSED CONTOUR
- 10 — MAJOR ELEVATION CONTOUR (5' INTERVAL)
- 1 — MINOR ELEVATION CONTOUR (1' INTERVAL)
- SLOPE
- X X — PROPOSED SILT FENCE



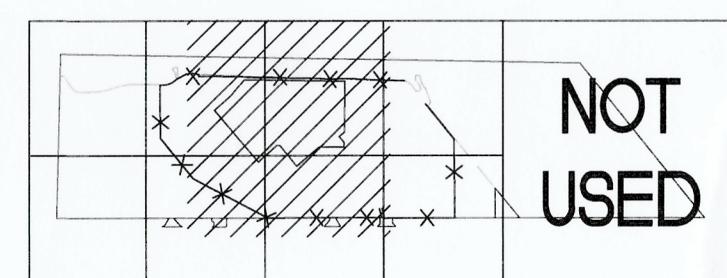
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TYPICAL SECTION

SCALE: NTS

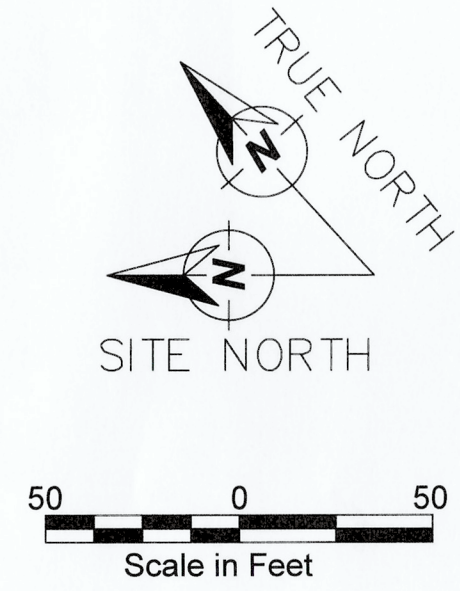
NOTES

1. A MINIMUM OF 1-FOOT OF CRUSHED SURFACING BASE COURSE WILL BE PLACED FOR FINE GRADING AND CONSTRUCTING FINAL CONTOURS OVER THE PVC LINER AND GEOTEXTILE.
2. ALL WALLS PROTECTED THROUGH CONSTRUCTION SHALL BE EXTENDED TO FINAL SURFACE ELEVATION AND FINISHED WITH 8-INCH FLUSH MOUNT MONUMENTS. ENGINEER TO APPROVE MONUMENT PROPOSED FOR USE.
3. THERE ARE TWO LOCATIONS WHERE CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC ARE TO BE INSTALLED. THESE LOCATIONS MAY BE FIELD ADJUSTED BY ENGINEER. THE REMAINDER OF THE CONTAINMENT WALL ALIGNMENT SHALL BE CONSTRUCTED WITH PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE NOT SUBJECT TO TRAFFIC.
4. PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC SHALL BE A MINIMUM WIDTH OF 20-FEET ALONG THE BARRIER WALL ALIGNMENT AND HAVE A MINIMUM TOTAL LENGTH OF 50-FEET, INCLUSIVE OF SLOPING EXACT LOCATION TO BE DETERMINED IN THE FIELD BY ENGINEER. CONTRACTOR SHALL INSTALL SURFACE WATER CONVEYANCE PIPING TO PROMOTE STORMWATER FLOW UNDER THE PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC. THIS SHALL CONSIST OF 8-INCH CORRUGATED DUAL WALL PIPE PLACED ON FINAL RESTORATION CONTOURS AS SHOWN ON THIS SHEET AND THE PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC CONSTRUCTED ABOVE THE PIPE(S). PLACEMENT OF THE PIPE(S) SHALL BE APPROVED BY THE ENGINEER.
5. EXTERIOR STORMWATER DIVERSION BERM SHALL REMAIN IN PLACE IN AREAS WHERE THE EXISTING GRADE IS HIGHER THAN THE RESTORATION GRADE TO PREVENT RUN ON OF SURFACE WATER FROM EXISTING GRADES TO RESTORATION AREA.
6. FINAL RESTORATION SURFACES SHALL BE ROLLED WITH A VIBRATORY DRUM COMPACTOR (CATERPILLAR CS12 SMOOTH DRUM ROLLER OR EQUIVALENT) EXCEPT WITHIN 10 FEET OF THE CONTAINMENT WALL. WITHIN 10 FEET OF THE CONTAINMENT WALL CONTRACTOR SHALL STATIC ROLL GRADED SURFACES WITH A CATERPILLAR CS5 SMOOTH DRUM ROLLER OR EQUIVALENT. LARGE COMPACTORS OR OTHER HEAVY EQUIPMENT SHALL NOT COME WITHIN 5 FEET OF THE CONTAINMENT WALL, EXCEPT AT DESIGNATED CROSSINGS. SEE DRAWING C1.4 FOR COMPACTION REQUIREMENTS DIRECTLY ABOVE CONTAINMENT WALL.



KEY PLAN

SCALE: NTS



6697

C1.9

SH #27 OF #44

ARKEMA INTERIM ACTION - PHASE 1

CONTAINMENT WALL

FINAL RESTORATION CONTOURS

SECTION: 36

RANGE: 21N

TOWNSHIP: 15.73

POB MON #178

DATE: 03/21/2011

VERT: 15.73

DATE: 03/21/2011

DRAWING SCALE: AS NOTED

PARCEL: 0321351053

PHASE: FOR BID

CONTRACTOR: PA000000403

DATE: 07/29/2026

PROJ. ENGR: TLOUVERE

DATE: 07/29/26

PRINTED BY: kbeagley

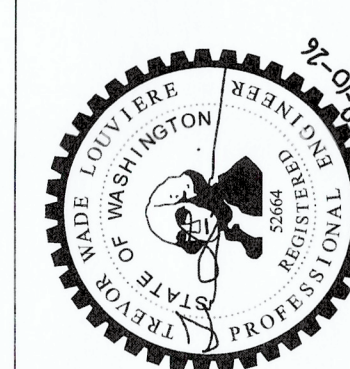
DATE: Sep 09, 2026

PORT ADDRESS: ONE SITCOM PLAZA

TACOMA, WA 98401-1837



DALTON OLUMSTED FUGLEVAND



APPROVED: *Dalton Olumsted Fuglevand*
DIRECTOR ENG. DATE: 07/29/26

CHECKED BY: R. WEBB
DATE: 07/29/26

PRINTED BY: kbeagley
DATE: Sep 09, 2026

PORT ADDRESS: ONE SITCOM PLAZA
TACOMA, WA 98401-1837

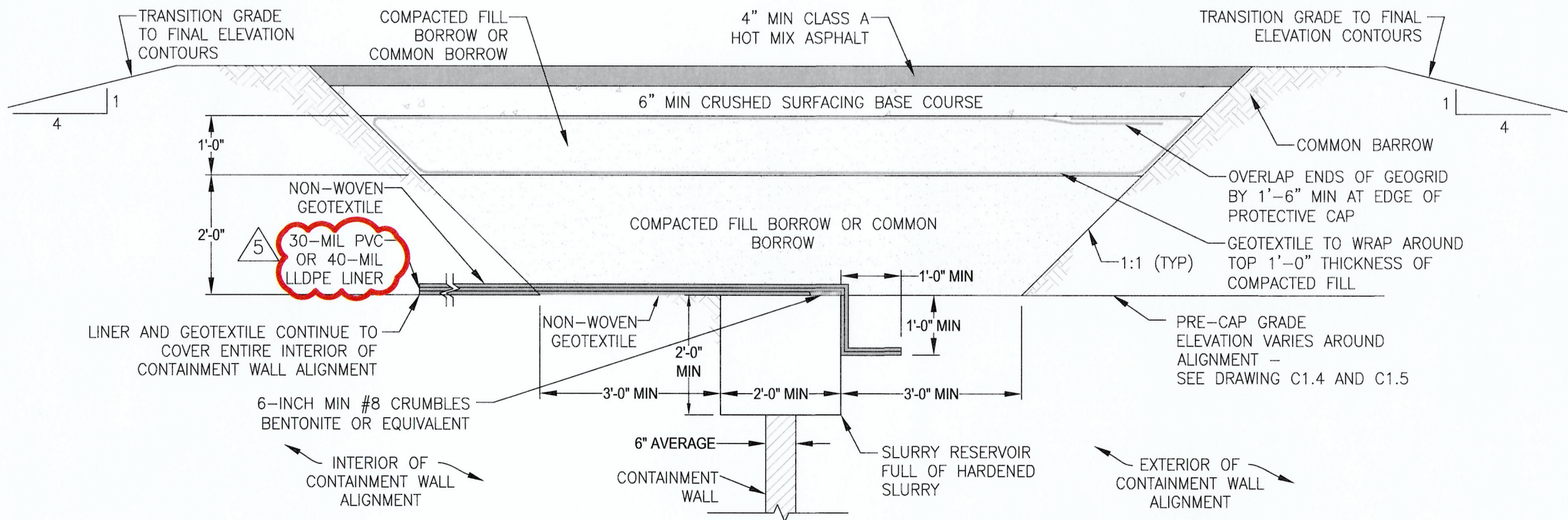
REVISION: BY: TL
DATE: 9/3/2026

ADDENDUM: 4
DATE: 9/9/2026

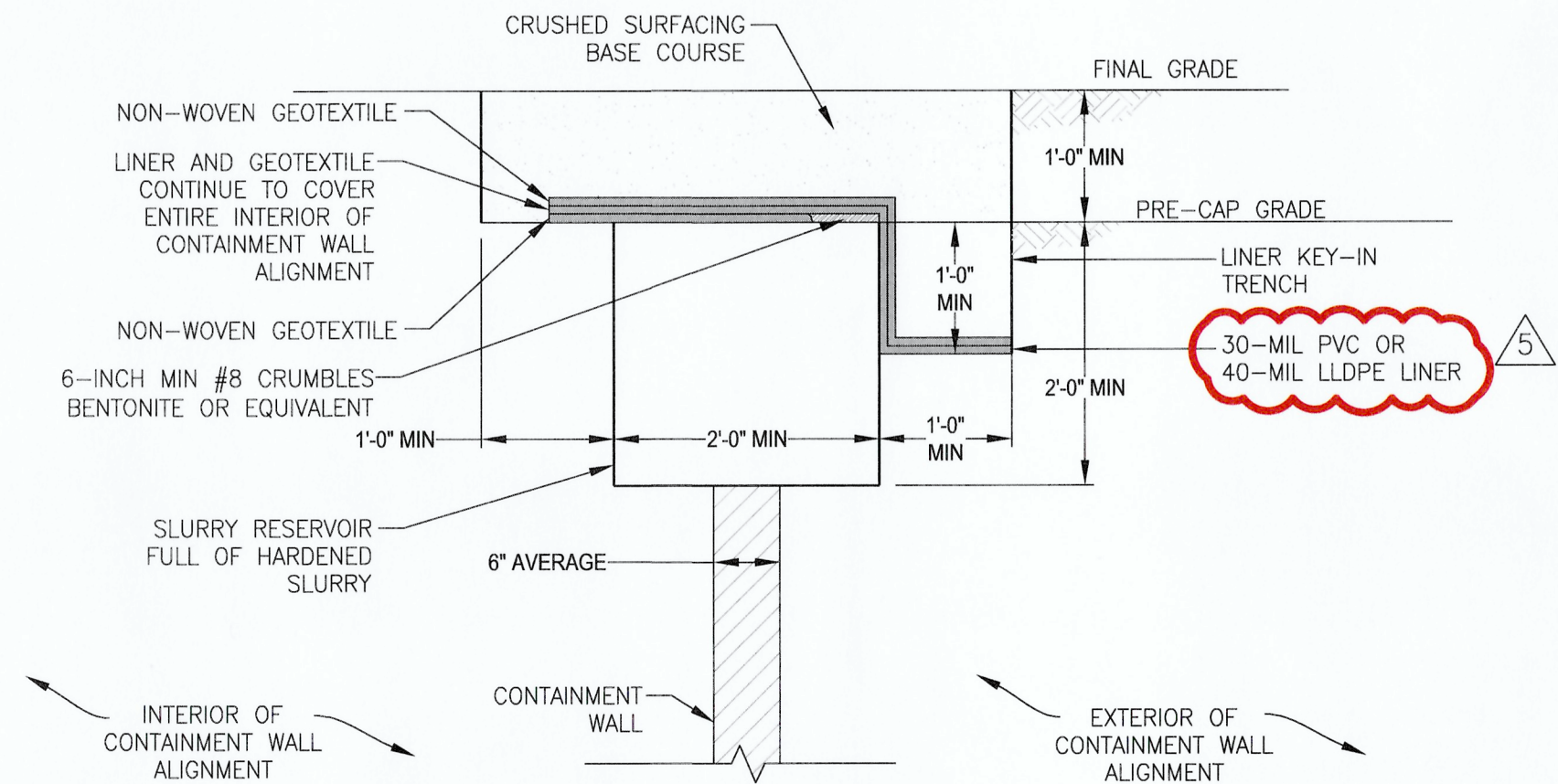
THIS DRAWING IS THE PROPERTY OF THE PORT OF TACOMA AND SHALL NOT BE USED ON OTHER WORK. DISCLOSED, COPIED, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION

NOTES

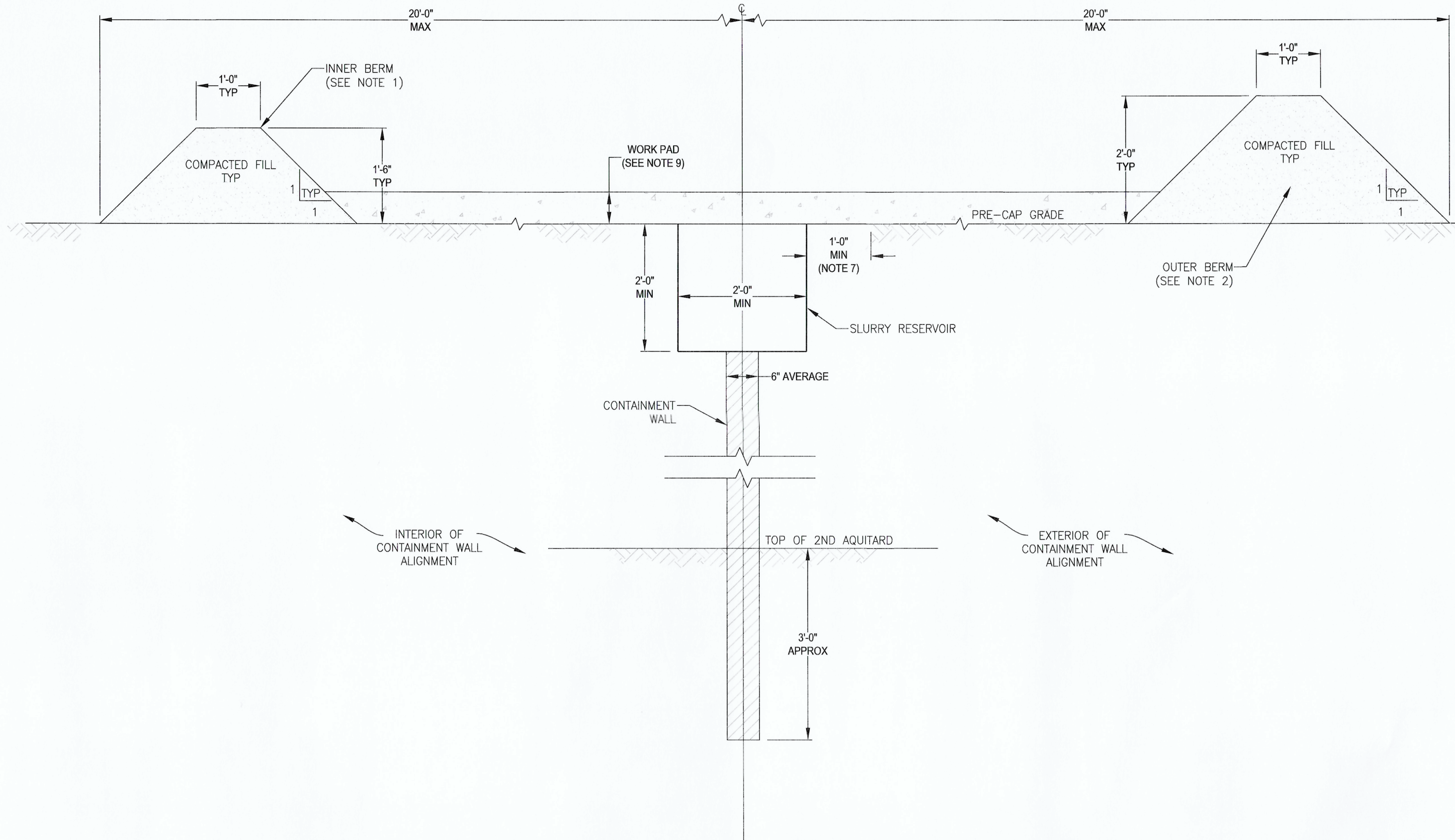
1. INSTALL INNER BERM IN THE ACTIVE AREA OF CONTAINMENT WALL CONSTRUCTION TO THE EXTENT NECESSARY TO ISOLATE TRENCH SLURRY FROM EXISTING SITE FEATURES. THE BERM MAY BE MOVED PROGRESSIVELY AS THE CONTAINMENT WALL IS CONSTRUCTED.
2. CONSTRUCT OUTER BERM OUTSIDE THE CONTAINMENT WALL ALIGNMENT PRIOR TO START OF ANY CONTAINMENT WALL CONSTRUCTION ACTIVITIES IN THE ACTIVE AREA. EXISTING BERMS THAT SATISFY THE MINIMUM REQUIREMENTS FOR THE STORMWATER BERM MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
3. WHERE PARTIAL DEMOLITION OF EXISTING ASPHALT PAVEMENTS OR CONCRETE SLABS AND FOUNDATIONS IS REQUIRED FOR CONSTRUCTION OF THE CONTAINMENT WALL, THE AREA OUTSIDE OF THE PROTECTIVE CAP SHALL BE HYDROSEED FOR PERMANENT SOIL STABILIZATION.
4. CONTAINMENT WALL TO BE OVERLAIN BY WALL PROTECTION CAP (SEE DETAILS 1 AND 2).
5. CONTRACTOR SHALL INSTALL SURFACE WATER CONVEYANCE PIPING TO PROMOTE STORMWATER FLOW UNDER THE PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC (DETAIL 1). THIS SHALL CONSIST OF 8-INCH CORRUGATED DUAL WALL PIPE PLACED ON FINAL RESTORATION CONTOURS AS SHOWN ON SHEET C1.9 AND THE PERMANENT CONTAINMENT WALL PROTECTIVE CAP WHERE SUBJECT TO TRAFFIC CONSTRUCTED ABOVE THE PIPE(S). PLACEMENT OF THE PIPE(S) SHALL BE APPROVED BY THE ENGINEER.
6. 30 MIL PVC LINER LOCATED BETWEEN TOP AND BOTTOM LAYERS OF GEOTEXTILE. LOWER LAYER OF GEOTEXTILE TERMINATES AT LOCATION OF #8 BENTONITE CRUMBLES, PVC LINER AND TOP LAYER OF GEOTEXTILE CONTINUE INTO KEY-IN TRENCH AS SHOWN IN DETAIL 1 AND 2.
7. CONTRACTOR SHALL PREVENT WORK PAD MATERIALS FROM RAVELING INTO THE SLURRY RESERVOIR DURING CONSTRUCTION.
8. IN SECTION A, THE 1'-0" MINIMUM REQUIREMENT IS RELATED TO WORK ALONG THE WATERWAY WHERE THE CONTAINMENT WALL WILL BE INSTALLED OFFSET OF THE EQUIPMENT.
9. COMPACT EACH LIFT OF BACKFILL MATERIAL TO AT LEAST 95% OF THE ASTM D1557 MAXIMUM DRY DENSITY. ALL BACKFILL SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT. ADDITIONAL CARE SHOULD BE TAKEN TO ENSURE THE TOP OF THE CONTAINMENT WALL IS NOT DAMAGED AS PART OF COMPACTION EFFORTS.
10. WORK PAD MAY BE CONSTRUCTED USING CLEAN AGGREGATES PER SPECIFICATIONS. THE BASE ESTIMATE ASSUMES DIMENSIONS OF 6-INCH THICKNESS AND 20-FOOT WIDTH. CONTRACTOR MAY USE ALTERNATE SUPPORT METHODS AS REQUIRED BY THEIR EQUIPMENT. AT CONTRACTOR'S DISCRETION, PORTIONS OF THE ALIGNMENT MAY NOT REQUIRE WORK PAD WHERE EXISTING SOILS ARE COMPETENT.



PERMANENT CONTAINMENT WALL PROTECTIVE CAP
1 WHERE SUBJECT TO TRAFFIC
C1.9
SCALE: NTS



PERMANENT CONTAINMENT WALL PROTECTIVE CAP
2 WHERE NOT SUBJECT TO TRAFFIC LOAD
C1.9
SCALE: NTS



TYPICAL SECTION THROUGH CONTAINMENT WALL
A DURING CONSTRUCTION
C1.5
SCALE: NTS

6697		ARKEMA INTERIM ACTION - PHASE 1										APPROVED:		R. WEBB 07/29/26						DALTON OLMSTED FUGLEVAND		Part of Tacoma P.O. BOX 1837 TACOMA, WA 98401-1837	
C1.10		CONTAINMENT WALL										CHECKED BY DATE		T.LOUVERE 07/29/26									
SH #28 OF #44		CONTAINMENT WALL DETAILS										DIRECTOR ENG. DATE		PROJ. ENGR DATE									
												PRINTED BY: kbedley Sep 09, 2026											
CONT/CONS: PAC00000403		TOWNSHIP: 21N		RANGE: 3E		SECTION: 36		MLW 15.73' @ POT MON #178		PORT ADDRESS: ONE SITCOM PLAZA		TACOMA, WA 98401-1837		MARK: 		REVISION: Addendum 5		BY: TL					
M. ID: 101585.01		DAT-HRZ: W883/2011		VERT: 0321351053		DRAWING SCALE: AS NOTED						APPR: TL		DATE: 9/9/2026									
PHASE: FOR BID		PARCEL: 0321351053																					

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PART 1 - GENERAL

1.01 SUMMARY

A. Contract Drawings: The following drawings are a part of the Contract Documents:

Sheet No.	Drawing Title
G1.0	Cover Sheet
G1.1	General Notes, Legend and Abbreviations
SV1.0	Topographic Survey
SV1.2	Topographic Survey - Area 2
SV1.3	Topographic Survey - Area 3
SV1.4	Topographic Survey - Area 4
SV1.5	Topographic Survey - Area 5
SV1.6	Topographic Survey - Area 6
SV1.7	Topographic Survey - Area 7
D1.0	Temporary Erosion and Sediment Control (TESC) Plan
D1.1	TESC Details
D2.0	Clearing and Grubbing
D3.0	Demolition Plan
D3.1	Existing Conditions - Subsurface Utilities 1
D3.2	Existing Conditions - Subsurface Utilities 2
D3.3	Existing Conditions - Subsurface Utilities 3
D3.4	Existing Conditions - Subsurface Utilities 4
C1.0	Containment Wall Alignment Plan
C1.1	Preload Plan and Detail
C1.2	Preload Profile 1 (STA 0+00 to 13+75)
C1.3	Preload Profile 2 (STA 13+75 to 21+68.8)
C1.4	Pre-Cap Grading Plan
C1.5	Stormwater Diversion Berm Construction
C1.6	Containment Wall Profile 1 (STA 0+00 to 11+00)
C1.7	Containment Wall Profile 2 (STA 11+00 to 21+68.80)
C1.8	PVC Liner System Plan
C1.9	Final Restoration Contours
C1.10	Containment Wall Details
C1.11	Final Restoration Cross Sections
C2.0	Overall Grading and Drainage Plan
C2.4	Grading and Drainage Plan - Area 4
C2.5	Grading and Drainage Plan - Area 5
C2.6	Grading and Drainage Plan - Area 6
C2.7	Grading Drainage Plan - Area 7
C2.9	Storm Drainage Notes and Details
C2.10	Treatment Vault Details 1

[5]

Sheet No.	Drawing Title
C2.11	Treatment Vault Details 2
C2.12	Outfall Profiles
C2.13	Structural Notes and Typical Details
C2.14	North Outfall Notes and Details
C2.15	South Outfall Notes and Details
C2.16	Storm Drain Profiles
C2.19	Storm Drain Profiles
C2.25	Storm Drainage Details

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

ARKEMA INTERIM ACTION - PHASE 1

PROJECT NO. 101585.01 | PROCUREMENT NO. 072026-1051

[5]

Scope of Work: The Work required for this Project includes:
Containment Wall: the work consists of constructing a continuous wall with a self-hardening slurry that consists of a mixture of ground granulated blast furnace slag, select clay and water to form a low permeability barrier to contain groundwater. The wall shall be keyed into the second site aquitard by vibrating beam methods.

Site Preparation and Wall Area Capping: the existing site will require preparation, excavation, fill, grading, demolition, surcharge, and temporary works prior to containment wall installation. An impervious cap consisting of imported soil, geotextile and a ~~PVC~~ liner will be placed over the wall area following wall installation to reduce stormwater infiltration within the containment wall.

[5]

Stormwater Conveyance Improvements: one new 30-inch outfall and one existing 36-inch outfall will be modified as part of the Work. Outfall construction and modification includes piping, vaults, headwalls, steel piling installation, check valves and cofferdams. A collection and conveyance system will be installed to connect the wall cap area to new and existing outfalls.

Bid Estimate: Estimated cost range is \$6,500,000 to \$7,000,000, plus Washington State Sales Tax (WSST).

In accordance with RCW 39.04.320, fifteen (15) percent apprenticeship participation is required for certain projects estimated to cost one million (\$1,000,000) dollars or more. Bidders may contact the Department of Labor and Industries, Specialty Compliance Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530, by phone (360) 902-5320, or e-mail at Apprentice@lni.wa.gov, to obtain information on available apprenticeship programs.

In accordance with new legislation HB 1050 all port districts are required to add the requirement that **apprentices must perform** 15% or more of the total labor hours in public works contracts estimated at \$1 million or more. If the 15% apprenticeship labor hours is met the contractor will receive an incentive fee of \$1,000. If less than 15% apprenticeship labor hours is used a \$500 decrease in the total amount of the contract will be taken for not meeting the required apprenticeship labor hours. L&I will monitor apprenticeship labor hours.

Sealed Bid Date/ Time/Location: Bids will be received at the Front Reception Desk, Port Administration Office, One Sitcum Plaza, Tacoma, Washington 98421 until **2:00 P.M. on September 17th**, 2026, at which time they will be publicly opened and read aloud and the apparent low bid will be determined.

Pre-Bid Conference and Site Tour: A pre-Bid conference and site visit have been set for August 20th, 2026 at 9:00 A.M. The site visit will convene at the project site. The following Protective Equipment is required for the site visit: sturdy shoes, reflective vest, gloves, and safety glasses. Attendees will be required to sign a Release and Acceptance of Responsibility and Acknowledgement of Risks Form prior to entering the site and shall provide their own Personal Protection Equipment (PPE) as required above.

Bid Security: Each Bid must be accompanied by a Bid security in an amount equal to five (5) percent of the Base Bid in a form allowed by the Instructions to Bidders.

Contact Information: Any questions to the Port may be submitted to the Procurement Department through the Procurement and Question Submission Portal (Portal link is accessible via this specific procurements website. See left side of page.). A direct link is also available here: [Procurement and Question Portal Link](#). No oral responses will be binding by the Port. Instructions for utilizing the portal can be found here: [Procurement and Question Submission Portal Instructions](#). Questions will not be accepted after seven (7) days prior to the Bid Date.

Bidding Documents: Plans, Specifications, Addenda, and Plan Holders List for this Project are available on-line through The Port of Tacoma's Website portoftacoma.com. Click on "Contracts," "Procurement," and then the Procurement Number 072026-1051. Bidders must subscribe to the Holder's List on the right hand side of the screen in order to receive automatic email notification of future addenda and to be placed on the Holder's List. Holder's Lists will be updated regularly and posted to the specific procurements page. Additional Instructions available in Section 00 21 00 - Instructions to Bidders.

Public Works Training Requirements: Effective July 1, 2019, all businesses are required to have training before bidding on public works projects and prevailing wage under RCW 39.04.359 and RCW 39.12, or is on the list of exempt businesses maintained by the Department of Labor and Industries. The bidder must designate a person or persons to be trained on these requirements. The training will be provided by the Department of Labor and Industries or by a training provider whose curriculum is approved by the Department of Labor and Industries.

Please refer to Labor and Industries' web site (https://www.lni.wa.gov/TradesLicensing/PrevWage/Contractors/Training.asp?utm_medium=email&utm_source=govdelivery) for more information and training dates, requirements, and exemptions. Failure to attend this training could result in a determination of "not responsible" and the bidder not being awarded a public works contract.

Project Specific Supplemental Bidder Criteria: Pursuant to RCW 39.04.350, Bidders are advised the Port has established relevant project specific Supplemental Bidder Responsibility Criteria for determining bidder responsibility included in Appendix D of the Responsibility Contract Documents.

Special Conditions: Partial funding of this project is being provided by the Washington State Department of Ecology. All terms and conditions included in the grant between the Port of Tacoma and Washington State Department of Ecology are fully incorporated into the Port of Tacoma agreement with the Contractor.

END OF SECTION

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THIS IS NOT TO BE SUBMITTED WITH A BID.

THE LOW RESPONSIVE BIDDER SHALL BE REQUIRED TO COMPLETE THIS RESPONSIBILITY DETAIL FORM AS SPECIFIED IN SECTION 00 21 00 - INSTRUCTIONS TO BIDDERS. **THIS COMPLETED RESPONSIBILITY DETAIL FORM SHALL BE SUBMITTED ELECTRONICALLY (PDF) VIA EMAIL TO THE CONTACT(S) IDENTIFIED IN THE LOW RESPONSIVE BIDDER SELECTION NOTIFICATION.**

BIDDER'S COMPANY NAME: _____

For the below Mandatory Bidder Responsibility Criteria, please mark the appropriate choice.

1.01 MANDATORY BIDDER RESPONSIBILITY CRITERIA

- A. The Bidder shall meet the following mandatory responsibility criteria as described in RCW 39.04.350(1). The Bidder shall be rejected as not responsible if any answer to questions 1 through 6 is "No" or any answer to questions 7 through 11 is "Yes."

1. Does the Bidder have a Certificate of Registration in compliance with RCW 18.27?
☐ Yes ☐ No
2. Does the Bidder have a current Washington State Unified Business Identifier number?
☐ Yes ☐ No
3. Does the Bidder have Industrial Insurance Coverage for the Bidder's employees working in Washington State as required in RCW 51?
☐ Yes ☐ No
4. Does the Bidder have an Employment Security Department number as required in RCW 50?

****Attach** letter dated within six (6) months of Bid Date.*

**Request a letter electronically by clicking on the following link
<https://fortress.wa.gov/esd/twt/pwcinternet/> or by emailing a request to
publicworks@esd.wa.gov.*
☐ Yes ☐ No
5. Does the Bidder have a Washington State Excise Tax Registration number as required in RCW 82?
☐ Yes ☐ No
6. Has the Bidder completed the training required by RCW 39.04.350, or is the Bidder on the list of exempt businesses maintained by the Department of Labor and Industries?
☐ Yes ☐ No
7. Has the Bidder been disqualified from bidding on any public works project under RCW 39.06.010 or 39.12.065(3)?
☐ Yes ☐ No

8. Has the Bidder violated RCW 39.04.370 more than one (1) time as determined by the Washington State Department of Labor and Industries?
- ☐ Yes ☐ No
9. Has the Bidder ever been found to be out of compliance with Apprenticeship Utilization requirements of RCW 39.04.320?
- ☐ Yes ☐ No
10. Has the Bidder ever been found to have willfully violated, as defined in RCW 49.48.082, any provision of Chapters 49.46, 49.48, or 49.52 RCW within the three- (3-) year period immediately preceding the date of this bid solicitation?
- ☐ Yes ☐ No
11. Has the bidder been subject to a revocation of a minor work permit under RCW 49.12.390.(4)?
- ☐ Yes ☐ No

[5] If any answer to questions 1 through 5-6 is "No" or any answer to questions 7 through 11 is "Yes" - **STOP HERE** and contact the Contract Administrator. The Bidder is not responsible for this Work. Otherwise proceed to 1.02. **Provide attached to this completed form documentation to confirm responsibility criteria.**

For remaining criteria below, check or fill-out the appropriate item. Based upon the answer provided by the Bidder, the Port may request additional information or seek further explanation. As needed, provide backup documentation for any explanations listed below.

1.02 CONTRACT AND REGULATORY HISTORY

- A. The Port will evaluate whether the Bidder's contract and regulatory history demonstrates an acceptable record of past project performance and consistent responsibility. The Bidder shall answer the following questions. The Bidder may be rejected as not responsible if any answer to questions 1 through 5 below is "Yes."

1. Has the Bidder had a contract terminated for cause or default in the last five (5) years?

☐ Yes, **If YES, explain below.** ☐ No

2. Has the Bidder required a Surety to take over all, or a portion of, a project to cure or respond to an asserted default or material breach of contract on the part of the Bidder on any public works project in the last five (5) years?

☐ Yes, **If YES, explain below.** ☐ No

3. Have the Bidder and major Sub-Bidders been in bankruptcy, reorganization, and/or receivership on any public works project in the last five (5) years?

☐ Yes, **If YES, explain below.** ☐ No

4. Have the Bidder and major Sub-Bidders been disqualified by any state or local agency from being awarded and/or participating on any public works project in the last five (5) years?

☐ Yes, **If YES, explain below.** ☐ No

5. Are the Bidder and major Sub-Bidders currently a party to a formal dispute resolution process with the Port (i.e., a pending mediation, arbitration, or litigation)?

☐ Yes, **If YES, explain below.** ☐ No

1.03 ACCIDENT/INJURY EXPERIENCE

- A. The Port will evaluate the Bidder's accident/injury Experience Modification Factor ("EMF") from the Washington State Department of Labor and Industries to assess whether the Bidder has an acceptable safety record preventing personal injuries on projects.
- B. List the Bidder's accident/injury EMF for the last five (5) years. An experience factor is calculated annually by the Washington State Department of Labor and Industries.

Year	Effective Year	Experience Factor
1		
2		
3		
4		
5		

If the Bidder has received an EMF of greater than 1.0 for any year, explain the cause(s) of the designation and what remedial steps were taken to correct the EMF. The Bidder may be rejected as not responsible if the Bidder's EMF is greater than 1.0 and sufficient remedial steps have not been implemented.

1.04 WORK PERFORMED BY BIDDER

- A. The Bidder shall state the amount of the Work, as an equivalent to the Base Bid, excluding taxes, insurance, and bonding, the Bidder will execute with its own forces.

_____ %

1.05 ADDITIONAL CONTRACTOR INFORMATION

- A. As part of completing this Responsibility Detail Form, **submit the following information with the completed Responsibility Detail Form:**
1. Bidder's recent job resume, including a list of similar projects performed and contact information for the similar project owner(s), a brief description of work, start and end dates, and contract amount.
 2. Resumes of Bidder's proposed project manager and job superintendent.

- B. The Bidder's failure to provide the required project information may result in a determination of the Bidder being declared non-responsible by the Port.
- C. The Bidder shall submit this completed, **SIGNED** Responsibility Detail Form electronically (PDF), with all requested backup documentation, via email to the contact(s) noted on the Low Responsive Bidder Selection Notification.
- D. The Bidder and its subcontractors to verify that its subcontractors at each tier meet the responsibility criteria as required by RCW 39.06.020 and 39.04.350.
1. Bidder shall verify major subcontractors meet the responsibility criteria required. Fill out one Port of Tacoma Public Works Project Bidder Evaluation Checklist for Subcontractors for each major subcontractor and submit to the Port with this form. Backup documentation is not required to be submitted.

PROJECT: Arkema Interim Action - Phase 1

PROJECT NO.: 101585.01

CONTRACT NO.: PA000000403

Responsibility Certification Form

The Low responsive Bidder shall complete the Responsibility Detail Form, attach all documentation, and submit to the Port within twenty-four (24) hours following receipt of the Low Responsive Bidder Selection Notification. All forms shall be submitted electronically (PDF) via email to the contact(s) listed on the Selection Notice. Note, the same project may be used to demonstrate experience across multiple categories if applicable.

By completing and signing this Responsibility Detail Form, the Bidder is certifying that the information contained within the Form, the backup documentation, and any additional information requested by the Port is true and complete. The Bidder's failure to disclose the required information or the submittal of false or misleading information may result in the rejection of the Bidder's Bid, revocation of award, or contract termination.

The information provided herein is true and complete.

Signature of Authorized Representative

Date

Print Name and Title

**PORT OF TACOMA PUBLIC WORKS PROJECT BIDDER EVALUATION CHECKLIST FOR
SUBCONTRACTORS**

PROJECT TITLE: Arkema Interim Action - Phase 1

BIDDER: _____

CONTRACT AND PROJECT NUMBER: PA000000403/ 101585.01

This checklist shall be completed by the Bidder and its subcontractors to verify that its subcontractors at each tier meet the responsibility criteria as required by RCW 39.06.020 and RCW 39.04.350.

This checklist should be submitted to the Port of Tacoma Contracts Administrator within twenty-four (24) hours of request.

Document verification information or backup data is not to be submitted to the Port, this information should remain on file with the Contractor and be presented to the Port if requested at a later date.

Item No.	Item	Initials/ Comments
1.	At the time of Bid submittal, have a certificate of registration in compliance with RCW 18.27: Check the L&I site https://secure.lni.wa.gov/verify/ Verify that a subcontractor has an electrical contractor license, if required by RCW 19.28, or an elevator contractor license, if required by RCW 70.87.	
2.	While reviewing registration information above, also check contractor's Employer Liability Certificate to verify workers' comp (industrial insurance) premium status – current account. Complete a "Submit Contractor Tracking Request" to be notified if the contractor fails to pay workers' comp premiums or renew their contractor registration or if their electrical contractor license is suspended or revoked within one year.	
3.	State excise tax registration number (Department of Revenue). (contractor's Washington State Unified Business Identifier and tax registration number) http://dor.wa.gov/content/doingbusiness/registermybusiness/brd/ .	
4.	Not disqualified from bidding on any public works contract under RCW 39.06.010 or RCW 39.12.065(3) . Check the Department of Labor and Industries https://secure.lni.wa.gov/verify/	
5.	Verify subcontractors are registered with the Washington State Employment Security Department (ESD) and have an account number. Request a letter to be sent from the subcontractor electronically by clicking on the following link https://esd.wa.gov/ or by emailing a request to	

Item No.	Item	Initials/ Comments
	publicworks@esd.wa.gov. Include ESD#, UBI#, and business name in the email. Certificate of Coverage letter issued/dated within the last six (6) months. Document if subcontractor confirms in writing, under penalty of perjury, that it has no employees and this requirement does not apply.	

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for the Contractor's insurance.

1.02 SUBMITTAL REQUIREMENTS

- A. Evidence of the required insurance within ten (10) days of the issued Notice of Award to the Contractor.
- B. Updated evidence of insurance as required until final completion.

1.03 COMMERCIAL GENERAL LIABILITY (CGL) INSURANCE

- A. The Contractor shall secure and maintain until Final Completion, at its sole cost and expense, the following insurance in carriers reasonably acceptable to the Port, licensed in the State of Washington, registered with the Washington State Insurance Commissioner, and possessing an A.M. Best rating of "A-, FSC six (6)" or better.
- B. The Port of Tacoma (Port) will be included as additional insureds for both ongoing and completed operations by endorsement to the policy using ISO Form CG 20 10 11 85 or forms CG 20 10 04 13 and CG 20 37 04 13 (or equivalent coverage endorsements). The inclusion of the Port as additional insureds shall not create premium liability for the Port.

Also, by endorsement to the policy, there shall be:

- 1. An express waiver of subrogation in favor of the Port;
 - 2. A cross liabilities clause; and
 - 3. An endorsement stating that the Contractor's policy is primary and not contributory with any insurance carried by the Port.
- C. If the Contractor, Supplier, or Subcontractors will perform any work requiring the use of a licensed professional, per RCW 18, the Contractor shall provide evidence to the Port of professional liability insurance in amounts not less than \$1,000,000.
 - D. This insurance shall cover all of the Contractor's operations, of whatever nature, connected in any way with the Contract, including any operations performed by the Contractor's Subcontractors of any tier. **It is the obligation of the Contractor to ensure that all Subcontractors (at whatever level) carry a similar program that provides the identified types of coverage, limits of liability, inclusion of the Port as additional insured(s), waiver of subrogation and cross liabilities clause.** The Port reserves the right to reject any insurance policy as to company, form, or substance. Contractor's failure to provide, or the Port's acceptance of, the Contractor's certificate of insurance does not waive the Contractor's obligation to comply with the insurance requirements of the Contract as specifically described below:
 - 1. Commercial General Liability Insurance on an Occurrence Form Basis including, but not limited to:
 - a. Bodily Injury Liability;
 - b. Property Damage Liability;
 - c. Contractual Liability;
 - d. Products - Completed Operations Liability;

- e. Personal Injury Liability;
 - f. By endorsement to the policy, not exclude work within fifty feet of any railroad track;
Alternatively, a Commercial General Liability (CGL) policy is acceptable if all of the above coverages are incorporated in the policy and there are no marine exclusions that will remove coverage for either vessels or work done by or above or around the water.
2. Comprehensive Automobile Liability including, but not limited to:
- a. Bodily Injury Liability;
 - b. Property Damage Liability;
 - c. Personal Injury Liability;
 - d. Owned and Non-Owned Automobile Liability; and
 - e. Hired and Borrowed Automobile Liability.
3. Railroad protective liability insurance naming the Port and Tacoma Rail as Insureds with coverage of at least \$2,000,000 per occurrence and \$6,000,000 in the aggregate. The policy must be issued on a standard ISO form CG 00 35 10 93 and include the following:
- a. Endorsed to include the Pollution Exclusion Amendment (ISO form CG 28 31 10 93);
 - b. Endorsed to include the Limited Seepage and Pollution Endorsement;
 - c. Endorsed to include Evacuation Expense Coverage Endorsement;
 - d. No other endorsements restricting coverage may be added; and
 - e. The original policy must be provided to the Port prior to execution of the Contract; within ten (10) days of Notice of Award.
4. Contractor's Pollution Liability (CPL) covering claims for bodily injury, property damage and cleanup costs, and environmental damages from pollution conditions arising from the performance of covered operations.
- a. If the Work involves remediation or abatement of regulated waste to include, but not limited to asbestos containing materials, lead containing products, mercury, PCB, underground storage tanks, or other hazardous materials or substances, the CPL policy shall not exclude such coverage, or a specific policy covering such exposure shall be required from the Contractor and all Subcontractors performing such Work.
 - b. If the Work involves transporting regulated materials or substances or waste, a separate policy or endorsement to the CPL policy specifically providing coverage for liability and cleanup arising from an upset or collision during transportation of hazardous materials or substances shall be required from the Contractor and all Subcontractors performing such Work.
 - c. It is preferred that CPL insurance shall be on a true occurrence form without a sunset clause. However, if CPL insurance is provided on a Claims Made basis, the policy shall have a retroactive date prior to the start of this project, and this insurance shall be kept in force for at least three years after the final completion of this project. Alternatively, the contractor, at its option, may provide evidence of extended reporting period of not less than three (3) years in its place. The Contractor shall be responsible for providing the Port with certificates of insurance each year evidencing this coverage.
 - d. The Port shall be named as an additional insured(s) on the CPL policy.

[5]

~~5. Technology Professional Liability Errors and Omissions Insurance appropriate to the Consultant's profession and work hereunder, with limits not less than \$2,000,000 per occurrence. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by the Vendor in this agreement and shall include, but not be limited to, claims involving infringement of intellectual property, copyright, trademark, invasion of privacy violations, information theft, release of private information, extortion and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations.~~

~~The policy shall include, or be endorsed to include, **property damage liability coverage** for damage to, alteration of, loss of, or destruction of electronic data and/or information "property" of the Agency in the care, custody, or control of the Vendor.~~

E. Except where indicated above, the limits of all insurance required to be provided by the Contractor shall be not less than \$2,000,000 for each occurrence. If the coverage is aggregated, the coverage shall be no less than two times the per occurrence or per claim limit. However, coverage in the amounts of these minimum limits shall not be construed as to relieve the Contractor from liability in excess of such limits. Any additional insured endorsement shall NOT be limited to the amounts specified by this Contract, unless expressly waived in writing by the Port.

F. Contractor shall certify that its operations are covered by the Washington State Worker's Compensation Fund. The Contractor shall provide its Account Number or, if self-insured, its Certificate of Qualification Number. The Contractor shall also provide evidence of Stop-Gap Employers' Liability Insurance.

United States Longshoremen's and Harbor Worker's Act (USL&H) and Jones Act may be required for this project. The Contractor shall be solely responsible for determining the applicability of USL&H and Jones Act coverage. The failure of the Contractor to procure either USL&H or Jones Act coverage shall at no time create liability on the part of the Port. The Contractor shall bear all responsibility and shall indemnify and hold harmless the Port for any and all liability, cost, and/or damages.

G. The Contractor shall furnish, within ten (10) days following issuance of the Notice of Award, a certificate of insurance satisfactory to the Port evidencing that insurance in the types and minimum amounts required by the Contract Documents has been secured. The Certificate of Insurance shall be signed by an authorized representative of the insurer together with a copy of the endorsement, which shows that the Port are named as additional insured(s).

H. Contractor shall provide at least forty-five (45) days prior written notice to the Port of any termination or material change, or ten (10) day's-notice in the case of non-payment of premium(s).

I. If the Contractor is required to make corrections to the Work after Final Completion, the Contractor shall obtain at its own expense, prior to the commencement of any corrective work, insurance coverage as required by the Contract Documents, which coverage shall be maintained until the corrections to the Work have been completed and accepted by the Port.

1.04 BUILDER'S RISK INSURANCE

A. Until Final Completion of the Work, the construction Work is at the risk of the Contractor and no partial payment shall constitute acceptance of the Work or relieve the Contractor of responsibility of completing the Work under the Contract.

- B. To the extent the Work provided under this Contract does not include the construction, rehabilitation or repair of any dam, road or bridge, and whenever the estimated cost of the Work is less than \$5,000,000, the Port and Contractor acknowledge that the Port will purchase, or has purchased, from a company or companies lawfully authorized and admitted to do business in Washington, property insurance written on a Builder's Risk "all-risk" (including Earthquake and Flood with applicable sub-limits) or equivalent policy form to cover the course of construction in the amount of the full insurable value thereof. This property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Port has an insurable interest in the property, whichever is later. Without further endorsement, the coverage afforded by this insurance includes the interests of the Port, the Contractor, and Subcontractors of any tier on the Project. Coverage for materials intended to be installed in the facility will be covered by the Builder's Risk policy. Losses up to the deductible amount, and payment of any deductible amount, shall be the responsibility of the Contractor. All tools and equipment not intended as part of the construction or installation (including but not limited to Contractor's equipment and tools) will NOT be covered by the policy.
- C. To the extent the Work provided under this Contract involves any dam, roadway or bridge, the value of which exceeds \$250,000, or whenever the estimated cost of the Work is equal to or greater than \$5,000,000, Contractor will purchase from a company or companies lawfully authorized and admitted to do business in Washington, property insurance written on a Builder's Risk "all-risk" (excluding Earthquake and Flood with applicable sub-limits) or equivalent policy form to cover the course of construction in the amount of the full insurable value thereof. This Builder's Risk insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Port has an insurable interest in the property, whichever is later. Contractor shall provide evidence satisfactory to the Port confirming the coverage afforded by this insurance shall include the interests of the Port, the Contractor, and Subcontractors of any tier on the Project. Coverage for materials intended to be installed in the facility will be covered by the Builder's Risk policy purchased by the Contractor. Losses up to the deductible amount, and payment of any deductible amount, shall be the responsibility of the Contractor.

In all instances, the Contractor shall obtain property insurance for all Contractor-owned equipment and tools and, in the event of loss, payment of any deductible amount shall be the responsibility of the Contractor.

PART 2 - PRODUCTS - NOT USED**PART 3 - PRODUCTS - NOT USED****END OF SECTION**

PART 1 - GENERAL**1.01 SCOPE**

- A. The accompanying Drawings and Specifications show and describe the location and type of Work to be performed under this project. Work is more specifically defined on the drawings listed in Section 00 01 15.
1. The Work under this contract is to provide, furnish and install all labor, materials and equipment required to complete the work, installed, tested, and ready for use, and as described in these documents.
 2. The Arkema Interim Action - Phase 1 consists of:
 - a. TESC: Project work will occur within an approximate 26 acre area that requires stabilization and stormwater management. Stormwater will be collected and infiltrated on site.
 - b. Demolition: The site operated as chemical plant for decades and remnant fixtures and debris remain on site. Demolition will primarily include breaking and stockpiling remnant concrete foundations for historical buildings, storage tanks, support towers and other structures. Concrete will be stockpiled on-site for re-use in future site development phases. Demolition activities will also include demolishing and stockpiling historical hot mix asphalt roadways and removal and disposal of abandoned rail ties and other miscellaneous debris.
 - c. Grading: Project earthworks will create a graded and free draining 10-acre area with two drainage basins at project completion. The area and basins will be built through several anticipated stages of grading before and after containment wall construction. The basins will be built by grading onsite material, available onsite fill, and importing new material.
 - d. Stormwater infrastructure: The project proposes to install a new outfall and adjust an existing outfall. Outfall work will require reinforced concrete headwall and pad construction in tidal conditions in conformance with project permits. The outfall structures will be built inside cofferdams. Outfall work includes installation of new tide valves. The stormwater work consists of installing multiple catch basins, treatment vaults and over 1,200 feet of piping. The majority of installed storm water infrastructure will be a part of the sites permanent stormwater drainage system. The installed piping and infrastructure will collect and convey surface water from the graded area to the Blair Waterway.
 - e. Containment wall installation: The work includes construction of a low permeability containment wall by vibrating beam methods around a contaminated groundwater plume. A mixture of slag, clay and water shall be installed by injection and displacement in panels that keyed into the second aquitard. Testing, monitoring and performance shall follow the specifications.
 - f. Containment wall capping: The containment wall shall be capped by geotextile and a **PVC**-liner to form an impermeable surface. Crushed surfacing base course shall be placed on the liner system to protect the liner and complete the capping system.

1.02 LOCATION

- A. The work is located at:

2901 Taylor Way

Tacoma, WA 98421

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Procedures for preparation and submittal of applications for progress payments.

1.02 PAYMENT PROCEDURES

- A. Monthly pay estimates shall clearly identify the work performed for the given time period based on the approved Schedule of Values.
 - 1. At the Pre-construction meeting, the Engineer and the Contractor shall agree upon a date each month when payment applications shall be submitted.
- B. For each pay estimate the Contractor shall submit the following:
 - 1. Completed Contractor invoice and updated Schedule of Values tracking sheet as required by Division 01 or as established by the Engineer.
 - 2. Baseline Project Schedule and narrative updated as required by Section 01 32 16 of the Project Manual.
 - 3. Completed "Amounts Paid to Subcontracts and Suppliers" showing total contract amount, amount paid this estimate, total paid to date, and balance owing.
 - 4. Completed "Conditional Release and Waiver of Liens and Claims."
 - 5. An estimated cashflow statement projecting the Contractor's monthly billings on the project shall be submitted with each payment application.
- C. Prior to submitting a payment application, the Contractor and Engineer shall meet each month to review the work accomplished to determine the actual quantities including labor, materials and equipment charges to be billed.
 - 1. Prior to the payment application meeting, the Contractor shall submit to the Engineer all measurement documentation as referenced in these contract documents; to include all measurement by weight, volume or field.
 - 2. For all change work being done on a force account basis, the Contractor shall submit prior to meeting with Engineer all Force Account back-up documentation as required to process the payment application where Force Account work is being billed. The Engineer and the Contractor shall review the documentation at the payment application meeting to verify quantities and review the work accomplished.
 - 3. The Contractor shall bring a copy of all documentation to the pay application meeting with the Engineer.
 - 4. The Contractor shall submit the updated baseline project schedule for review prior to submitting the payment application to ensure the payment processing is not held up due to necessary schedule revisions.
- D. Following the Engineers' review, the Contractor shall submit the agreed upon pay estimate electronically, with complete supporting documentation attached, using Adobe PDF file format to cpinvoices@portoftacoma.com.

1.03 PAYMENT PRICING

- A. Pricing for the various lump sum or unit prices in the Bid Form, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the work in accordance with the requirements of the Contract Documents.
- B. Pricing also includes all costs of compliance with the regulations of public agencies having jurisdiction, including safety and health requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- C. No separate payment will be made for any item that is not specifically set forth in the Bid Form, and all costs therefore shall be included in the prices named in the Bid Form for the various appurtenant items of work.
- D. All other work not specifically mentioned in the measurement and payment sections identified below shall be considered incidental to the work performed and merged into the various unit and lump sum prices bid. Payment for work under one item will not be paid for under any other item.
- E. The Port of Tacoma reserves the right to make changes should unforeseen conditions necessitate such changes. Where work is on a unit price basis, the actual quantities occasioned by such changes shall govern the compensation.

1.04 LUMP SUM MEASUREMENT

- A. Lump sum measurement will be for the entire item, unit of Work, structure, or combination thereof, as specified and as indicated in the Contractor's submitted bid.
 - 1. If the Contractor requests progress payments for lump sum items, such progress payments will be made in accordance with an approved Schedule of Values. The quantity for payment for completed work shall be an estimated percentage of the lump sum amount, agreed to between the Engineer and Contractor, payable in monthly progress payments in increments proportional to the work performed in amounts as agreed between the Engineer and the Contractor.

1.05 MEASUREMENT OF QUANTITIES FOR UNIT PRICES

- A. Measurement Standards:
 - 1. All Work to be paid for at a contract price per unit measurement, as indicated in the Contractor's submitted bid, will be measured by the Engineer in accordance with United States Standard Measures.
- B. Measurement by Weight:
 - 1. Unless shipped by rail, material to be measured and paid for by weight shall be weighed on sealed scales regularly inspected by the Washington State Department of Agriculture's Weights and Measures Section or its designated representative. Measurement shall be furnished by and at the expense of the Contractor. All weighing, measuring, and metering devices shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Washington State Department of Transportation Standard Specifications, Division 1, General Requirements, Article 1-09.2, Weighing Equipment.

2. Provide or utilize platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. Scales shall be inspected and certified as often as the Engineer may deem necessary to ascertain accuracy. Costs incurred as a result of regulating, adjusting, testing, inspecting, and certifying scales shall be borne by the Contractor.
 3. A licensed weighmaster shall weigh all Contractor-furnished materials. The Engineer may be present to witness the weighing and to check and compile the daily record of such scale weights. However, in any case, the Engineer will require that the Contractor furnish weight slips and daily summary weigh sheets. In such cases, furnish a duplicate weight slip or a load slip for each vehicle weighed, and deliver the slip to the Engineer at the point of delivery of the material.
 4. If the material is shipped by rail, the certified car weights will be accepted, provided only actual weight of material will be paid for and not minimum car weights used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants. Material to be measured by weight shall be weighed separately for each bid item under which it is to be paid.
 5. Trucks used to haul material being paid for by weight shall be weighed empty daily and at such additional times as the Engineer may require. Each truck shall bear a plainly legible identification mark. The Engineer may require the weight of the material be verified by weighing empty and loaded trucks on such other scales as the Engineer may designate.
- C. Measurement by Volume:
1. Measurement by volume will be by the cubic dimension indicated in the Contractor's submitted bid. Method of volume measurement will be by the unit volume in place or removed as shown on the Contract Drawings or as specified.
 2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Contractor in writing and accepted by the Engineer in writing, the material may be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Resident Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be accepted.
- D. Measurement by Area: Measurement by area will be by the square dimension shown on the Contract Drawings or as specified. Method of square measurement will be as specified.
- E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Contractor's submitted bid. Unless otherwise indicated, items, components, or Work to be measured on a linear basis will be measured at the centerline of the item in place.
- F. Field Measurement for Payment:
1. The Contractor shall take all measurements by providing equipment, workers, and survey crews as required to measure quantities in accordance with the provisions for measurement specified herein. No allowance will be made for specified tolerances.
 2. The Engineer will verify all quantities of Work performed by the Contractor on a unit-price basis, for progress payment purposes.

1.06 REJECTED, EXCESS, OR WASTED MATERIALS

- A. Quantities of material wasted or disposed of in a manner not called for under the Contract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Contractor to conform to the provisions of the Contract; material not unloaded from the transporting vehicle; material placed outside the lines indicated on the Contract Drawings or established by the Engineer; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No additional compensation will be permitted for loading, hauling, and disposing of rejected material.

1.07 MEASUREMENT AND PAYMENT

A. Item #1: Mobilization and Demobilization

- 1. Payment for Mobilization and Demobilization shall be for preparatory work and operations performed by the Contractor including, but not limited to, those necessary for the movement of its personnel, equipment, supplies and incidentals to and from the project site; temporary facilities and controls; for the establishment and removal of its offices, buildings and other facilities necessary for work on the project; for other work and operations which it must perform or costs it must incur before beginning production work on the various items on the project site, and for removal of personnel, equipment, supplies, offices, building facilities, sheds, fencing, and other incidentals from the site. This item shall include an office location for the Engineer's representative.
- 2. Mobilization and Demobilization shall be paid at the lump sum price listed in the Contractor's submitted bid. Incremental payment shall be made for each location as follows:
 - a. 40% after completion of 5% of the total contract amount of other bid items have been earned.
 - b. 40% after completion of 20% of the total contract amount of other bid items have been earned.
 - c. 20% after completion of all work on the project has been completed, including cleanup and acceptance of the project by the Port.

B. Item #2: Project Administration

- 1. Item Description: The Work of this item includes all administrative costs associated with administering and supervising the project including, but not limited to supervision of personnel, coordination of all work activities, coordination of subcontractors and/or suppliers, preparation and transmittal of submittals, permit acquisitions, for premiums on bonds and insurance for the project, and project overhead.
- 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
- 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.

C. Item #3: TESC

1. Item Description: The Work of this item includes all labor, equipment and materials necessary to furnish, install, maintain, improve and remove best management practices (BMP's) to manage erosion, water quality and stabilize the site in accordance with project Specifications and Drawings. The Work shall include updating, maintaining and reporting requirements and obligations of the General Construction Stormwater Permit.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- D. Item #4: Clearing and Grubbing
1. Item Description: The Work of this item includes all labor, equipment and materials necessary to remove and dispose of trees, shrubs and other vegetative growth within the limits shown on the Drawings.
 2. Measurement: This item will be measured by ACRE complete for the overall area complete.
 3. Payment: This item will be paid for by ACRE as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- E. Item #5: Demolition - Asphalt (4-inch Thickness)
1. Item Description: The Work of this item includes all labor, material and equipment as necessary for the demolition of existing asphalt surfaces. The item shall include the excavation, handling, transport, stockpiling and stockpile covering for future reuse of asphalt material. Stockpile location shall be on site as directed by Engineer.
 2. Measurement: This item will be measured by Cubic Yard (CY) in stockpile locations.
 3. Payment: This item will be paid based on actual quantities for the period being billed.
- F. Item #6: Demolition - Concrete
1. Item Description: The Work of this item includes all labor, material and equipment as necessary for the demolition of existing concrete structures. This item shall include the breaking, excavation, handling, transport, stockpiling and stockpile covering for future reuse of concrete material. Concrete thicknesses range between 6-inches and 2-feet in areas identified for demolition. Stockpile location shall be on site as directed by Engineer.
 2. Measurement: This item will be measured by Cubic Yard (CY) in stockpile locations.
 3. Payment: This item will be paid for based on actual quantities for the period being billed.
- G. Item #7: Demolition - Rail Road Ties
1. Item Description: The Work of this item includes all labor, material, equipment and fees as necessary to legally remove and dispose creosote rail road ties from within the TESC limits. Rail ties remain in historical rail alignments where rails were previously removed.
 2. Measurement: This item will be measured by Ton.
 3. Payment: This item will be paid for based on actual quantities by Ton for the period being billed.
- H. Item #8: Demolition - Subsurface Utilities

1. Item Description: The Work of this item includes all labor, material, equipment and as necessary to cut and grout plug existing utilities and remove obstructions in accordance with the Specifications and Drawings. This work shall include any trenching, backfill and dewatering to complete the work. Dewatering shall include pumping and conveyance to the Temporary Utility Trench Dewatering Pump and Treatment System. Disposal of removed utilities and obstructions shall be paid in accordance with Item #9: Demolition - Miscellaneous Debris Allowance.
 2. Measurement: This item will be measured by LS.
 3. Payment: This item will be paid for based on percentage complete for the period being billed.
- I. Item #9: Demolition - Miscellaneous Debris Allowance
1. Item Description: The Work of this item includes all labor, material and equipment as necessary for the demolition, collection and disposal of existing miscellaneous debris on site. This Item shall include utilities, metal pipe, steel casing, plastic pipe, miscellaneous steel such as grates, covers, and bollards, conduit, conductors, and other debris. The estimate assumes 17 tons of debris could be collected. Concrete debris is not included and shall be stockpiled in accordance with Bid Item #6 - Demolition - Concrete.
 2. Measurement: This item will be measured by Ton.
 3. Payment: This item will be paid for based on actual quantities.
- J. Item #10: Preload Placement & Compaction - On Site Material
1. Item Description: The Work of this item includes all labor, material and equipment as necessary to excavate, transport, place and compact existing site soil material as Preload Placement and Compaction in preparation for Containment Wall and Storm Piping installation from within the Dredging Sediment Pile area located at the southwest corner of the site. The Engineer estimates 5,700 cubic yards are available for use on site and assumes 3,700 cubic yards will be used as preload.
 2. Measurement: This item will be measured by cubic yard (CY).
 3. Payment: This item will be paid for based on actual quantities for the period being billed.
- K. Item #11: Preload Placement & Compaction - Import Material
1. Item Description: The Work of this item includes all labor, material and equipment as necessary to transport, place and compact import soil materials as preload in preparation for Containment Wall installation. The Engineer estimates 9,320 cubic yards of import will be necessary to complete preload placement and compaction. Source material approval and testing shall be in conformance with the contract documents and Department of Ecology approved work plans for the site. The Engineer estimates 9,300 cubic yards of imported material for preload placement and compaction will be repurposed under Item #27: Containment Wall Surfacing.
 2. Measurement: This item will be measured by cubic yard (CY).
 3. Payment: This item will be paid for based on actual quantities for the period being billed.
- L. Item #12: Preload Removal & Stockpiling

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to excavate, transport and stockpile excess surcharge material in accordance with project Specifications and Drawings. The Work shall also include installation of a stockpile cover.
2. Measurement: This item will be measured by Cubic Yard.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

M. Item #13: Storm Drain Preload Removal

1. Item Description: The Work of this item includes all labor and equipment as required to remove the uppermost 2 feet of installed preload material located above the project storm drain utility in accordance with the drawings and specifications. The removed material may be graded down the preload slope and compacted so that the finish graded slope is flatter than the temporary preload slope. The Engineer estimates a volume of 710 cubic yards.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on percentage complete for the period being billed.

N. Item #14: Pre-cap Grading and Earthworks

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to establish the Pre-Cap Grading Plan contours and elevations in accordance with project Specifications and Drawings. This item includes grading existing site soils from within the grading limits as well as grading existing site soils from the Dredging Sediment Pile. The Engineer estimates the grading of 9,400 cubic yards of cut from existing site soils from within the grading limits. The Engineer estimates an additional 2,400 cubic yards of material from the Dredging Sediment Pile will be required to meet the Pre-Cap Grading Plan contours and elevations. The Contractor shall assume 1,200 cubic yards of Preload Placement & Compaction - On Site Material shall be repurposed and paid for under Item #12: Preload Removal and Stockpiling. The contractor shall assume this bid item will include the excavation, transportation, grading and compaction of an additional 1,200 cubic yards of onsite soils from the Dredging Sediment Pile shall be to meet the required elevations .
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.

O. Item #15: North Outfall

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install the North Outfall. The North Outfall shall include all work components in accordance with the project Specifications, permits, and Drawings from the start of the slab to the end of the splash pad. This bid item shall include, but not be limited to, excavations, sheet pile wall cofferdams and dewatering installations, import aggregate backfill, the transport of trench spoils to a covered onsite stockpile location, concrete headwall, debris barrier and splash pad installations, and the subsequent removal of temporary facilities. This item does not include Storm Piping or WASTOP In-Line Check Valves.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

P. Item #16: South Outfall

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install the South Outfall. The South Outfall shall include all work components in accordance with the project Specifications, permits, and Drawings from the start of the slab to the end of the splash pad. This bid item shall include, but not be limited to, removal of existing outfall tide gate valve, modifying the existing outfall piles, excavations, the transport of trench spoils to a covered onsite stockpile location, sheet pile wall cofferdams and dewatering installations, import aggregate backfill, concrete headwall, debris barrier and splash pad installations, and the subsequent removal of temporary facilities. This item does not include Storm Piping or WASTOP In-Line Check Valves.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

Q. Item #17: Storm Piping

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install project Storm Piping in accordance with project Specifications and Drawings. The Work shall include, but not be limited to the salvage of existing 36" diameter HDPE storm piping, excavation, dewatering and conveyance of trench groundwater to the Temporary Utility Trench Dewatering Pump and Treatment System, providing and installation of import storm piping bedding, trench dams, and trench backfill aggregate materials, and the transport of trench spoils to a covered onsite stockpile location. The Work shall include drainage system testing and reporting as required by the Specifications and Drawings to verify drainage system performance and the subsequent removal of all temporary facilities.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

R. Item #18: Utility Structures

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install project Utility Structures in accordance with project Specifications and Drawings. The Work includes, but is not limited to, excavation, dewatering and conveyance of trench groundwater to the Temporary Utility Trench Dewatering Pump and Treatment System, providing and installation of import utility structure foundation, bedding and trench backfill aggregate materials, and the transport of trench spoils to a covered onsite stockpile location. The Work shall include the removal of temporary facilities, the required fill transport and grading to establish the proposed finish grade around each structure. Material from the Dredging Sediment Pile may be used to establish indicated finish grades.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

S. Item #19: Treatment Vaults

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install project Treatment Vaults in accordance with project Specifications and Drawings. The work shall also include procuring and installing the vault utility structure, the vault media, the vault plumbing, the vault metalwork, excavation, import backfill, the transport of trench spoils to a covered onsite stockpile location, and dewatering and conveyance of groundwater to the Temporary Utility Trench Dewatering Pump and Treatment System as required.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

T. Item #20: Inline Check Valves

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install Inline Check Valves in accordance with project Specifications and Drawings.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed.

U. Item #21: Temporary East-West Ditch Stormwater Reroute Pump System

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish, install and remove temporary pump system to reroute stormwater around the existing outfall during Outfall South, Storm Piping and Utility Structure Work that impacts existing ditch drainage. The work shall include restoring the ditch to the lines and grades prior to system installation. Temporary security fencing and relocation of traffic barriers shall be included in this item.
2. Measurement and Payment: This item shall be paid at the lump sum price listed in the Contractor's submitted bid as follows:
 - a. 80% after completion of system installation
 - b. 20% after removal of system and existing ditch restoration

- V. Item #22: Temporary East-West Ditch Stormwater Reroute Pump System Operation
1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to operate and maintain the Temporary East-West Ditch Stormwater Reroute Pump System to manage ditch drainage surface water. This item shall assume the system will operate up to 21 days.
 2. Measurement: This item will be measured by DAY.
 3. Payment: This item will be paid for based on actual quantities for the period being billed.
- W. Item #23: Temporary Utility Trench Dewatering Pump and Treatment System
1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install a water treatment system capable of receiving pumped utility trench and excavation groundwater consisting of arsenic contaminated dewatering water. The system shall be designed by the contractor to meet discharge and treatment criteria as specified in the Project Drawings, Specifications and Permits.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- X. Item #24: Temporary Utility Trench Dewatering Pump and Treatment System Operation
1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to operate and maintain the Dewatering Pump and Treatment System to manage arsenic contaminated utility trench groundwater dewatering discharge. This item shall assume the system will operate up to 21 days.
- Y. Item #25: Containment Wall
1. Item Description: The Work of this item includes all labor, material, testing, and equipment as necessary to furnish and install the Containment Wall to the dimensions and elevations per the Specifications and Drawings. This item shall include Protective Caps Where Subject to Traffic, berms as required to isolate slurry work areas and Work Pad to support Containment Wall construction equipment.
 2. Measurement: This item will be measured by vertical square foot (VSF).
 3. Payment: This item will be paid for based on actual quantities for the period being billed in accordance with the approved Schedule of Values.
- Z. Item #26: Permanent Containment Wall Protective Cap
1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and install the Permanent Containment Wall Protective Cap per the Specifications and Drawings. This work shall include two (2) layers of non-woven geotextile, the ~~30-mil PVC~~ liner, and liner key-in trench. This work shall include fusing the cap to PVC monitoring well casings.
 2. Measurement: This item will be measured by square foot (SF).
 3. Payment: This item will be paid for based on actual quantities for the period being billed.
- AA. Item #27: Containment Wall Surfacing

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to furnish and grade a (1) one-foot thick crushed surfacing base course rock cap on top of and around the Permanent Containment Wall Protective Cap to the elevations and grades of the Restoration Surface. This item estimates import, placement, and compaction of 9,300 cubic yards of either Preload Placement & Compaction - Import Material or virgin material that meets the Specifications.
2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
3. Payment: This item will be paid for based on actual quantities for the period being billed in accordance with the approved Schedule of Values.

BB. Item #28: Trench Safety Systems.

1. Item Description: The Work of this item includes shoring and safety systems for all trench excavations exceeding 4-foot depths.
2. Measurement: This item will be measured as a lump sum unit.
3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid.

CC. Item #29: Utility Trench Over Excavation and Backfill Allowance

1. Item Description: The Work of this item includes all labor, material, equipment as necessary to provide authorized over excavation and backfill below the contract trench subgrade elevations. The Work includes, but is not limited to, excavation below the contract trench bedding subgrade elevation to replace a soft trench foundation, shoring, dewatering, replacing the excavated over excavation volumes with 2"-4" quarry spalls backfill, and compaction to the required trench bedding subgrade elevation to provide a firm trench foundation.
2. Measurement: This item shall be field measured (length of trench (ft) x width of trench (ft) x depth of trench (ft) / 27 cft/cy x 1.7 tons/cy) = Tons. The Contractor and the Engineer shall agree upon the measurements in the field prior to requesting payment.
3. Payment: This item will be paid as on a case-by-case basis and deducted from the total or remaining allowance figure. For example, if the total allowance figure is XX tons (100 tons initially), and there are 3 new cases that the total requires 30 tons payment, then 30 tons will be paid at the Unit bid price and the allowance figure total is reduced to XX-30 ton total (100-30 = 70 tons). Should the entire allowance be used, then an additional allowance figure will be established in accordance with contract requirements. Should the contract not require 100 tons, then there will be a net credit to the Port at the project conclusion.

[1] DD. Item #30: Shoreline Debris Removal

1. Item Description: The Work of this item includes all labor, material, and equipment as necessary to remove (10) ecology blocks from the shoreline and place them upland at a location within the property as directed by the Engineer. This item shall also include removal of a 3.5 foot by 3.5 foot by 3.5 foot boulder off the northwest corner of the existing concrete pier. The boulder shall be placed in the Demolition - Concrete stockpile. No wetlands shall be disturbed by Contractor operations. Any disturbed shoreline shall be restored to pre-activity conditions. See Section 00 31 00 – Available Project Information for additional information.
2. Measurement: This item will be measured as a lump sum unit.

3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXEUTION - NOT USED

END OF SECTION

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PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Earthwork shall include, but not be limited to:
1. Excavation, fill and grading of existing native soils and/or import soils.
 2. Processing, preparation and management of existing excavated soils for onsite reuse.
 3. Excavation and backfill for utilities and utility structures.
 4. Grading, contouring and preparation of grades and subgrades for sitework.
 5. Fill and backfill of soils to required elevations.
 6. Surveying for earthwork, utilities and record documents.
 7. Provide and install geotextile and ~~PVC~~-liner materials.
 8. Provide and install various import soil materials.
 9. Provide various import utility bedding and backfill soils specified herein.
 10. Providing and managing earthwork material stockpiles.
 11. Earthwork compaction to required densities.
 12. Earthwork Quality Control.
 13. Earthwork protection.
 14. Final grading.
 15. Provide quarry spall apron pads and shoreline protection.
 16. Earthwork maintenance.
 17. Soil Material Disposal.

1.02 PROJECT STAGING OF THE WORK

- A. Stage 1 work shall consist of installing TESC measures.
- B. After Stage 1 work is complete, Stage 2 work shall be initiated. As shown on the Contract Documents, Stage 2 work consists of:
1. Site Clearing and Grubbing work
 2. Selective Site Demolition work.
 3. ~~Barrier-Containment~~ Wall pre-load installation.
 4. Stormwater Outfall work, weather and permitting schedule pending.
- C. After Stage 2 work is complete, Stage 3 work shall be initiated. As shown on the Contract Documents, Stage 3 work consists of:
1. Stormwater Outfall work, weather and permitting schedule pending.
 2. Stormwater System pre-load installation.
 3. Completing earthwork cuts and fills and grading to Pre-Cap Grade. If after all grading is complete to the required subgrade elevations, provide a detailed topographic survey to demonstrate installation compliance with the contract document requirements.

D. After Stage 3, the Contractor shall complete Stage 4. As shown on the Contract Documents, Stage 4 work consists of:

1. Stormwater system installation (piping and structures).
2. Barrier Containment Wall installation.
3. Install the stormwater treatment vaults.

E. After Stage 4, the Contractor shall complete Stage 5. As shown on the Contract Documents, Stage 5 work consists of:

1. Installation of the Barrier Wall Liner System and gravel cover.
2. Providing an as-built survey and the civil 3D surface model of the finish grade surface to the Engineer.
3. Providing seeding work.

F. After Stage 5, the Contractor shall complete Stage 6. As shown on the Contract Documents, Stage 6 work consists of:

1. Completing Punchlist work.
2. Completing Record Drawing work.
3. Completing Contract Document work.
4. Obtaining Final Approvals and Acceptances.

1.03 EARTHWORK DEFINITIONS (DEFINITIONS ARE LISTED ALPHABETICALLY)

- A. Authorized Backfill: Authorized backfill is the backfill of specified soil materials, at the direction of the Engineer, placed in authorized overexcavation to return area to line and grade shown on the Contract Documents.
- B. Authorized Overexcavation: Authorized overexcavation is the excavation of soil materials, at the direction of the Engineer, beyond lines and grades shown on the Contract Documents.
- C. Backfill Material: Soil materials used to fill an excavation.
- D. Common Soil Material: Onsite native soils or reclaimed soils (contaminated or mixed imported and/or native soils). Native soil materials may be difficult to install or work during wet weather construction due to its moisture sensitivity.
- E. Common Fill Material: Common fill material shall consist of approved common soil materials that are used for fill purposes.
- F. Excavation: The removal of material located above and to required lines, grades, dimensions and subgrades.
- G. Fill Material: Satisfactory soil materials used to raise grades that are higher in elevation (or above) existing grades.
- H. Import Soil Materials: Approved soil materials provided from offsite sources. See PART 2 and Section 31 05 16 – Aggregates for specific import soil material requirements.
- I. Pipe Zone Bedding and Backfill Material: Soil bedding and backfill material placed below, around and above utility piping.
- J. Satisfactory Soil Materials: Satisfactory soil materials are soils that are free of unsuitable soils and are at or below the optimum moisture content as approved by the Engineer.

- K. Soft Spot: A pocket or spot in the existing native soil or improved subgrade that is structurally unstable and will not pass a proof roll test.
- L. Structures: Above or below ground man-made facilities that may include, but not be limited to underground utility vaults, catch basins/manholes.
- M. Subgrade: Surface or elevation remaining after completing an excavation or fill/embankment or backfill that subsequent import soil materials are constructed upon.
- N. Unsatisfactory Soil Materials: Unsatisfactory soil materials are soils that have not been approved for specified installations, are soils that are mixed with other deleterious soils due to the Contractor's operations or are soils that have deteriorated due to excessive moisture. Unsatisfactory soil materials have no acceptable installations unless they are processed to comply with common fill material requirements.
- O. Unsuitable Soil Material: Existing native soils that consist of, but are not limited to peat, muck, swampland or soils containing clay, debris, waste, frozen materials, vegetable organics, tree roots or other deleterious matter. Existing native soils classified as GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487 or a combination of these groups are unsuitable. Unsuitable soils also include large rocks or boulders which are too large to effectively allow compaction in lifts as required for common fill.
- P. Utilities: Underground or above ground pipes, conduits, and structure located over the site.
- Q. Utility Structures: Underground vaults, catch basins and manholes used with utilities.
- R. Utility Structure Bedding Material: Satisfactory import soil material placed below the utility structure and above the structure foundation grade to provide utility structure support.
- S. Utility Trench or Structure Foundation: Firm, unyielding soils located below the respective utility or structure. See Drawing cross sections.

1.04 SUBMITTALS

The Contractor shall prepare and submit the following to the Engineer:

- A. For Import Aggregate Materials:
 - 1. Comply with Section 31 05 16 Aggregate requirements.
 - 2. Comply with Interim Action Work Plan Appendix I for Acceptance Criteria for Virgin Quarry Material.
- B. Manufacturer's Data Certificate: Provide supplier name of materials
- C. Temporary Sheet Pile Cofferdam Shop Drawings
- [3] D. Surveying product deliverables stamped by PLS (in Autocad Civil 3D-2024 edition and PDF): Coordinate with Section 01 71 23 - Field Engineering requirements.
 - 1. The project pre-load measurements.
 - 2. The project as-builts (a Topographic survey of all work performed).
 - [3] 3. The finish subgrade-Pre-Cap Grade surface.
 - [3] 4. The finishFinal Ggrade surface.

E. Contractor Work Plan: The Contractor shall submit a work plan (combination of drawings and description) for approval. Plan shall include truck loading and truck routes to prevent tracking of contaminated material from the work area in accordance with specification 02 60 00. Plan shall include methods for adhering to soil movement criteria specified in section 1.05.B.

[3] F. Contractor Quality Control Plan (CQC Plan) for the Liner System: The Contractor shall submit a quality control plan for approval. Plan shall include material certifications and documentation, quality control testing, experience of QC team, methods for documenting installation and repair work and provide as-builts. Quality control activities included in the CQC Plan shall be consistent with industry standards.

[5] F.G. ~~Manufacturer Certificates~~ shall be provided showing that materials meet product property standards and shall include, but not necessarily be limited to:

1. Geotextile.

[5] 2. Polyvinyl Chloride (PVC) or Linear Low-Density Polyethylene (LLDPE) liner.

1.05 JOB CONDITIONS

A. The project site is an active contaminated soil site. Former owners included Arkema, Elf Ato Chem, AtoFina Chemicals to name a few. The main constituent to remediate is arsenic. Previous remediation work has been performed to limit the movement of arsenic in groundwater, including installation of a sheet pile wall, ferric chloride injections and limited excavation.

B. All excavated soil materials shall be treated as arsenic impacted materials. All excavated soil materials (except for site clearing waste materials) shall remain onsite.

[3] 1. All excavated soils located within the barrier-containment wall limits shall remain within the barrier-containment wall limits. The barrier-containment wall limits are shown on the drawings.

[3] 2. All excavated soils located outside of the barrier-containment wall limits may be placed as common fill located either inside or outside of the barrier-containment wall limits. The barrier-containment wall limits are shown on the drawings.

C. The site is a historical industrial site and debris may be encountered during excavation.

1. Trash, concrete, wire, rope or other industrial waste shall be considered as debris.

2. Boulders and large rocks shall be considered as debris.

3. Vegetation from clearing and grubbing shall be considered as debris.

D. Geotechnical Information is available in Section 00 31 00 Available Project Information includes relevant portions of the former Arkema Manufacturing site Geotechnical Memorandum, dated November 8, 2024, prepared by Sage Geotechnical and boring logs prepared as part of the pre-design investigation.

E. Existing site soils are moisture sensitive and there is a seasonably high groundwater table.

F. The project earthwork volumes do not balance. The project requires import soil volumes. All onsite soils (excluding site clearing waste soils) shall remain onsite. The Contractor shall be entirely responsible to provide satisfactory soil volumes to meet required plan grade elevations.

G. Provide TESC stockpile protection BMP's in accordance with the SWPPP.

H. The Contractor is advised to review the rainfall and weather records over the last year (2025 to present). Actual rainfall records over the last year may vary from average normal (NOAA)

rainfall totals. The actual rainfall may have saturated existing soils and/or raised or lowered the groundwater tables over the site.

- I. Schedule: Coordinate this work with critical time schedule established for construction and take necessary measures to ensure schedule is met. Coordinate with Project Sequencing/Scheduling requirements.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All imported materials shall be of good quality and of the quantity, size, shape, and gradation specified herein. Coordinate with Section 31 05 16 Aggregates for import soil requirements.
- B. All import material shall be from Engineer approved source.
- C. All approved materials shall be provided from single source throughout the Work.
- D. The use of import recycled concrete and asphalt materials is NOT allowed.
- E. The use of recycled onsite concrete and asphalt materials is allowed.

2.02 GEOTEXTILE FABRIC

A. Geotextile for Shoreline Stabilization

1. Non-woven geotextile fabric shall be placed over all excavated shoreline protection areas, prior to the placement of quarry spalls, as shown on the Contract Documents.
2. Fabric shall be non-biodegradable; resistant to most soil chemicals, and acids and bases in the pH range of 3 to 12; free of defects or flaws which significantly affect its physical properties; protected from ultraviolet degradation. Use of fabric other than Carthage Mills FX®-160HS or Amoco 4516 will require approval by the Engineer prior to use.

B. Geotextile for Barrier Containment Wall PVC-Liner Protection

1. Non-woven geotextile fabric shall be placed below and above either the 30-MIL PVC liner or 40-MIL LLDPE, as shown on the Contract Documents.
2. Fabric shall be non-biodegradable; resistant to most soil chemicals, and acids and bases in the pH range of 3 to 12; free of defects or flaws which significantly affect its physical properties; protected from ultraviolet degradation. Use of fabric other than TenCate Mirafi® 140N will require approval by the Engineer prior to use.

C. Geotextile for all other applications

1. Geotextiles shall consist only of long chain polymeric fibers or yarns formed into a stable network such that the fibers or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the material shall be polyolefins or polyesters. The material shall be free from defects or tears. The geotextile shall also be free of all treatment or coating which might adversely alter its hydraulic or physical properties after installation.
2. Stabilization Geotextile Fabric shall be woven and conform to the following requirements:
 - a. Grab Tensile Strength: 315 lbf, minimum; ASTM D4632.
 - b. Seam Breaking Strength: 270 lbf, minimum; ASTM D4632.
 - c. Tear Strength: 112 lbf, minimum; ASTM D4533.
 - d. Puncture Resistance: 620 lbf, minimum; ASTM D6241.

- e. Apparent Opening Size: No. 40 sieve, maximum; ASTM D4751.
 - f. Permittivity: 0.10 per second, minimum; ASTM D4491.
 - g. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.
 - h. Grab Failure Strain: <50%; ASTM D4632.
- D. Use of fabric other than that specified will require approval by the Engineer prior to use.
- E. PVC liner
- 1. Thickness: 30 MIL $\pm$ 1.5 MIL; ASTM D5199.
 - 2. Tensile Properties; ASTM D882:
 - a. Strength at Break: 73lbs/in. width, minimum.
 - b. Elongation: 380%, minimum.
 - c. Modulus at 100%: 30 lbs/in. width, minimum.
 - 3. Tear Strength: 8 lbs, minimum; ASTM D1004.
 - 4. Dimensional Stability: 3%, maximum change; ASTM D1204
 - 5. Seam Strength; ASTM D7408
 - a. Shear Strength: 58 lbs/in. width, minimum.
 - b. Peel Strength: 15 lbs/in. width, minimum.
 - 6. Specific Gravity: 1.2, minimum; ASTM D792.
 - 7. Water Extraction: 0.15%, maximum; ASTM D 1239
 - 8. Volatile Loss: 0.70%, maximum; ASTM D1203
 - 9. Resistance to Soil Burial; ASTM G160
 - a. Breaking Factor: 5% change, maximum.
 - b. Elongation at Break: 20% change, maximum.
 - c. Modulus at 100% Elongation: 20% change, maximum.
 - 10. Hydrostatic Resistance: 100 lbs/in², minimum; ASTM D751.
 - 11. Plasticizer Minimum Average Molecular Weight: 400g/mol; ASTM D2124.

[5] F. LLDPE liner

- 1. Thickness: 40 MIL $\pm$ 1.5 MIL; ASTM D5199.
- 2. Tensile Properties; ASTM D6693:
 - a. Strength at Break: 160lbs/in. width, minimum.
 - b. Elongation: 800%, minimum.
- 3. Tear Strength: 22 lbs, minimum; ASTM D1004.
- 4. Puncture Resistance: 56 lbs, minimum; ASTM D4833
- 5. Carbon Black Content: 2-3%; ASTM D4218
- 6. Specific Gravity: 0.939, maximum; ASTM D792.

PART 3 EXECUTION

3.01 GENERAL

- A. Prior to start of Earthwork, the Contractor shall:
 - 1. Complete required TESC Erosion controls work.
 - 2. Complete site clearing and grubbing of work areas.
 - 3. Complete required Selective Demolition work.
- B. Mining onsite materials for offsite export use is prohibited.
- C. Open Excavations
 - 1. The Contractor shall minimize the extent of open Excavations after regular working hours.
 - 2. The Contractor shall backfill all daily Excavations so that there are no open Excavations at the end of each work day.
- D. Dewatering: Comply with Section 31 23 19 Dewatering requirements.
- E. Project Sequencing/Scheduling requirements: The Contractor shall expect to perform Earthwork work during rainy/wet weather conditions in the spring, summer, fall and winter months. The Contractor shall implement and employ means and methods necessary to execute earthwork work in accordance with Plan and Specification requirements and within the project schedule time frame. Schedule work to minimize existing earthen soil disturbances.
- F. Traffic: Conduct Earthwork operations to ensure minimum interference with roads and other adjacent property. Do not close or obstruct streets or other occupied or used facilities without permission from authorities having jurisdiction.
- G. Surveying: All Construction survey work shall be performed by a licensed Surveyor or someone who works under the supervision of the licensed Surveyor of Record. All survey product deliverables shall be stamped and sealed by the Surveyor of Record.
- H. TESC: Provide soil stockpile covers and protection from the weather in accordance with Section 01 57 13 TESC and CSWPPP requirements.

3.02 INTERTIDAL WORK

- A. Intertidal Work
 - 1. Portions of the work along the Hylebos Waterway shoreline and the East-West ditch are located below the high tide line or ordinary high water level of Hylebos Waterway (approximately elevation +13.5 ft. Mean Lower Low Water (MLLW), work in the intertidal zone (shoreline generally below +13.5 ft. MLLW) are submerged under water during high tides and exposed ground during low tides. The Contractor's intertidal work shall comply with all aspects of the U.S. Army Corps of Engineers permit for the project, and in accordance with the Contract Documents.
 - 2. Work between 0 feet and +13.5 feet MLLW
 - a. The Contractor shall schedule work between May 1, 2026 through February 14, 2027.
 - b. The Contractor shall schedule work during low tides of elevations that are at least 2 feet below the elevation of active work in order to work "in the dry".
 - c. The Contractor shall only excavate as much intertidal area as can be compacted by an excavator mounted plate compactor that delivers a minimum impulse force of 16,000 lbs. at 2,100 cycles per minute or similar equipment prior to inundation by tidal waters.

The hoe pack shall function and operate in accordance with the manufacturer's specifications.

- d. Prior to inundation by tidal waters, the Contractor shall establish a smooth surface free of depressions that might otherwise result in entrapment of juvenile salmonids or other fish with the falling tide.
3. Work below +13.5 feet MLLW shall be conducted when tides are out and below the elevation of the work area when reasonably possible. When not so, the work can be completed when area is submerged during permitted in water work period. For in water work, provide a contractor design-build temporary steel sheet pile cofferdam so that the adjacent Hylebos Waterway may be kept clean during outfall construction.
- [5] 4. The Contractor ~~shall~~ may use land-based or barge supported equipment for work ~~unless approved otherwise by the Engineer.~~ Barge-based equipment shall adhere to the following requirements:
- a. Barges, vessels or equipment shall not be allowed to ground out or rest on the shoreline.
- 4.b. A portion of the intertidal and subtidal areas between the existing pier and south outfall is protected by environmental caps installed as part of the environmental remediation efforts for the Head of Hylebos Problem Area of the Commencement Bay/Nearshore Tideflats (CB/NT) Superfund Site led by the US EPA. These caps cannot be penetrated or disturbed by barges or other marine equipment operations. Refer to Section 00 31 00 - Available Project Information for cap location.
5. The Contractor shall provide a design-build temporary sheet pile cofferdam within the outfall work space to allow outfall work performance. Remove temporary sheet pile cofferdam upon completion of the outfall work. Complete the shoreline protection immediately upon temporary cofferdam removal.
6. Heavy construction equipment (like excavators, dozers, cranes, dump trucks, etc.) shall be kept off of the intertidal portion of the site and work from above elevation +13.5 ft. MLLW. Positioning of construction equipment below elevation +13.5 ft. MLLW is allowed only upon approval of a detailed Contractor work plan for such activities, and only when not practical otherwise. Or the Contractor may work within the temporary sheet pile cofferdam work space.
7. A containment boom shall be installed and maintained in the water adjacent to the intertidal work areas prior to and during the commencement of Excavation activities. The containment boom shall be installed outside of the temporary cofferdam and maintained throughout the outfall work duration.
- a. The containment boom shall be a typical floating hard boom, such as an oil containment boom, with material (e.g., rubber) extending 4 feet below the water surface. The purpose of the boom shall be to deter fish from entering the littoral habitat adjacent to the work being completed on the intertidal shoreline and to contain floatable debris that is released during the work.
- b. Installation of the boom shall ensure that no fish are trapped within the contained area during low tides.
- c. If fish are observed within the contained area, the Contractor shall remove the boom temporarily to release observed fish and then re-install the boom after releasing observed fish.

3.03 EXISTING UTILITIES IN RIGHT OF WAY

- A. Contact and notify utility agencies as required by state laws prior to commencing Work. Call Local Utility Line Information service at [1-800-424-5555] not less than 3 (three) working days before performing Work. Request existing underground Utilities to be located and marked within and adjacent to the project work area.
- B. If Utilities are to remain in place, provide adequate means of protection during Earthwork operations.
- C. Maintain and protect above and below grade existing Utilities to remain.
- D. Do not interrupt existing Utilities serving facilities occupied and used by others except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided. Temporary utility services may be required. Provide minimum of three business working days' notice to utility agency and Engineer and receive written notice to proceed before interrupting utility.
- E. Expose existing Utilities when necessary to ensure that no grade conflict exists with utilities.
- F. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- G. Damage to existing Utilities that are to remain shall be repaired to the Utility Purveyors requirements at no additional cost to the Port.

3.04 ONSITE REUSE

- A. The Contractor shall consider all excavated material as suitable for onsite reuse as Common Fill Material located in the onsite subgrade installation except for the following:
 - 1. Site clearing materials.
 - 2. Debris, rocks, boulders, and vegetation waste
 - 3. Selective demolition materials (see section 02 41 19 for specifics).
- B. The Contractor may stockpile excavated common soil material for onsite reuse as follows:
 - 1. Stockpile soil materials suitable for reuse until required for fill.
 - 2. Locate stockpiles away from edge of excavations.
 - 3. Stockpile materials for reuse without intermixing with other soils or import aggregate materials.
 - 4. Place, grade and shape stockpiles for proper drainage, directing surface water away from stockpile site to prevent erosion or deterioration of materials.
- C. The Contractor may use satisfactory onsite common soils for the utility pre-load work in accordance with Drawing requirements.
- [5] D. Only clean virgin soils are allowed/installed above the ~~PVC-Liner System~~ iner and located within the gravel cap section.

3.05 IMPORT MATERIAL STOCKPILE

- A. The Contractor shall stockpile delivered Import Soil Materials in approved areas only, in a manner that will not endanger Work and will not obstruct access routes.
- B. The Contractor shall prevent the Import Soil Material stockpiles from contamination or intermixing with common soils.

3.06 CONDUCT OF EXCAVATION

- A. The Contractor shall excavate to required subgrade elevations, lines and grades shown on the Contract Documents within specified tolerances regardless of character of materials and obstructions encountered unless otherwise directed by the Engineer.
 - 1. If the Contractor identifies Unsuitable Soil Material, notify the Engineer. Unsuitable Soil Material shall be removed, stockpiled onsite, and tested by the Port for disposal.
 - 2. Unsatisfactory Soil Materials located within contract Excavation extents shall be removed as Excavation, stockpiled onsite and covered in accordance with Section 01 57 13 TESC and CSWPPP requirements. The unsatisfactory soils shall be processed to comply with common fill requirements or stockpiled onsite for reuse at a later date.
 - 3. Common Soil Material located within contract Excavation extents shall remain onsite and may be used for satisfactory common fill purposes or stockpiled for future use.
 - 4. In the event that materials used for decommissioning shallow groundwater monitoring wells are encountered in Excavations, such as clays and bentonite, the materials shall remain onsite and may be used for satisfactory common soil purposes.
 - 5. Comply with paragraph 1.05.B, JOB CONDITIONS requirements.
- B. Excavations: Excavations shall comply with WAC 296-155, Part N OSHA, WISHA, local codes and ordinances having jurisdiction. The site is underlain by Type C soils per WAC 296-155-66401 and a seasonal high groundwater table. The Contractor is responsible for all Excavation and trench safety. Provide and install timbering and sheeting, trench boxes and shoring as necessary to protect workers, work, existing Utilities and other properties where sloping is not possible because of space restrictions or instability of material excavated; remove timbering and sheeting, trench boxes and shoring above pipe prior to backfilling Excavations.
- C. Should uncharted, or incorrectly charted, piping or other Utilities be encountered during Excavation, the Contractor shall consult utility agency immediately for directions and cooperate with Engineer and utility agencies in keeping respective services and facilities in operation; and repair damaged utilities to satisfaction of utility agency.
- D. Excavations for Site Improvements:
 - 1. Excavation for Quarry Spall Pads: Excavate to the required elevations, lines and grades within the specified tolerances
- E. Excavations to Subgrade: Execute Subgrade and Grade to Inspection requirements in paragraph 3.13 SUBGRADE AND GRADE TO INSPECTIONS.

3.07 CONDUCT OF SHORELINE EXCAVATION

- A. The Contractor shall excavate the Hylebos shoreline to the lines, grades (within ± 0.1 ft.), and extents shown on the Contract Documents for shoreline protection and onsite reuse. The Engineer will observe the Excavation and may provide guidance on modification to Excavation extents based upon observed field conditions.
- B. The Contractor shall stockpile existing excavated shoreline materials designated for reuse located in approved areas only. See Plans for specific materials. Otherwise, existing excavated shoreline materials shall be considered as Common Soil Material.
- C. The Contractor shall use dump trucks or containers for transport within the site that do not leak material or water.

3.08 CONDUCT OF UTILITY AND UTILITY STRUCTURE EXCAVATIONS

- A. The Contractor shall excavate utility trenches for underground storm drain utility piping and Utility Structure installations, to the line and grade shown on the Contract Documents.
-

- B. The Contractor shall excavate trenches sufficiently wide to enable installation of Utilities and allow inspection.
- C. Slope sides of Excavations shall comply with WAC 296-155, OSHA, WISHA, local codes and ordinances having jurisdiction. The Contractor shall provide and install timbering and sheeting, trench boxes and shoring as necessary to protect workers, work, existing Utilities and other properties where sloping is not possible because of space restrictions or instability of material excavated. The Contractor shall remove timbering and sheeting, trench boxes and shoring above pipe prior to backfilling Excavations.
- D. The Contractor's trenching operations shall not proceed more than 100 feet in advance of pipe laying except with written approval of the Engineer.
- E. The Contractor shall not disturb bottom of excavations intended as bearing surfaces. Provide firm foundation for Utilities and Utility Structures.
- F. Execute Subgrade and Grade to Inspection requirements in paragraph 3.14 SUBGRADE AND GRADE TO INSPECTIONS.

3.09 CONDUCT OF AUTHORIZED OVEREXCAVATION AND BACKFILL

- A. The Contractor shall not excavate or backfill beyond the lines and grades shown in the Contract Documents unless authorized by the Engineer. Unauthorized overexcavation and backfill shall be at the Contractor's expense.
- B. Overexcavation and backfill that is required to repair deteriorated grades, as a result of the Contractor's operations will not be considered Authorized Overexcavation and backfill work.
- C. The Engineer shall direct the Contractor to excavate beyond the lines and grades shown on the Contract Documents and to backfill the Authorized Overexcavation in accordance with Bid Item ~~#28-29~~ provisions. Overexcavation and backfill may be required in the following cases:
 - 1. Unsuitable Soil Materials exposed at required Excavations to Subgrades.
 - 2. Unsatisfactory soils due to excessive moisture in native soils located at required gravel cover section Excavations to Subgrades.
 - 3. Unsuitable Soil Materials exposed at the trench foundation grade.
 - 4. Unsatisfactory soils due to excessive moisture at the trench foundation grade.
- D. Authorized Overexcavation and backfill quantities shall be quantified as Excavation cubic yards. The Contractor and the Engineer shall agree in writing to the in-place, neat line, field measured Authorized Overexcavation quantity. The Contractor shall backfill the overexcavation with specified materials. Contractor reimbursement for overexcavation and backfill work is included in the Unit Price.
- E. The Contractor shall record all Authorized Overexcavation and backfill locations on the Record Drawings.

3.10 CONDUCT OF PRE-LOAD FILL PLACEMENT

- A. The Contractor shall not begin the pre-load fill until demolition and site clearing operations are complete.
- B. Place the pre-load fill in accordance with the plan requirements. Unless otherwise specified on the drawings, the pre-load material shall comply with import gravel borrow requirements. Coordinate with Section 31 05 16 Aggregates for Earthwork requirements.
- C. Place pre-load monitoring plates and measure the elevations at 30' intervals along the perimeter, bi-weekly. The Contractor shall provide detailed elevations of the pre-load at the

beginning and end of the pre-load time duration. The pre-load time duration is estimated to be 2 months. The elevations shall be recorded by a professional land surveyor.

- D. The Contractor shall provide the preload data to the Engineer to determine whether the preload can be removed. To remove the preload, the settlement data must show a linear trend when plotted against the logarithm of time, and the average difference between the last two readings shall be less than 0.02 ft. The Engineer may select other criteria to evaluate preload removal, based on the observed performance of the preload.
- E. Upon completion of the pre-load embankment work, the Contractor may reuse the pre-load materials in the construction of the barrier-containment wall outer berm (provided the material is kept clean, the barrier-containment wall inner berm and/or the common fill within the barrier-containment wall limits. At the utility pre-load, the Contractor shall remove the upper portion of the pre-load in accordance with Plan requirements.

[3]

3.11 CONDUCT OF SHORELINE BACKFILL AND STABILIZATION PLACEMENT

- A. The Contractor shall not begin backfill or shoreline stabilization until soil Excavation elevations have been approved by the Engineer.
- B. Conduct of Geotextile Fabric Placement
 - 1. The Contractor shall place geotextile fabric on all excavated shoreline areas as shown on the Contract Documents and in accordance with manufacturer's recommendations.
 - 2. The Contractor shall roll out geotextile fabric oriented up and down the slope.
 - 3. The Contractor shall overlap adjacent pieces of geotextile fabric a minimum of 3 feet. The Contractor shall install geotextile fabric such that a single piece covers the slope from the lower limit to the top of slope with no joints or overlaps.
 - 4. The Contractor shall place geotextile fabric in a manner that avoids ripping of the material during shoreline protection material placement.
- C. Conduct of Import Material Placement
 - 1. The Contractor shall place materials to the lines, grades, and thicknesses shown on the Contract Documents.
 - 2. The Contractor shall start material placement at the bottom of the slope and proceed upward.
 - 3. The Contractor shall place Import Soil Materials by methods which do not tend to segregate rock/particle sizes.
 - 4. The Contractor shall use an excavator mounted plate compactor (hoepac) that delivers a minimum impulse force of 16,000 lbs. at 2,100 cycles per minute or similar equipment prior to compaction of shoreline protection import materials, except riprap. The hoepac shall function and operate in accordance with the manufacturer's specifications.

3.12 CONDUCT OF EARTH EMBANKMENT FILL AND BACKFILL

- A. The Contractor shall provide satisfactory fill and backfill installations in accordance with Contract Document requirements. The Contractor shall:
 - 1. Pass the Subgrade and Grade to Inspection test.
 - 2. Place backfills and fills in continuous layers not more than 8 (eight) inches in loose depth for material compacted by heavy compaction equipment and not more than 4 (four) inches in loose depth for material compacted by hand-operated tampers.

3. Do not place Backfill Material or Fill Material on surfaces that are unsatisfactory, muddy and wet.
4. Place backfill and fill soil materials evenly on all sides of Structures and Utilities to required elevations, and uniformly along the full length of each Structure.
5. Before compaction, moisten or aerate each layer to required percentage of maximum dry density or relative dry density.
6. Compact backfill and fill in accordance with requirements herein.

3.13 CONDUCT OF UTILITY AND UTILITY STRUCTURE BACKFILL

- A. Pass the Subgrade and Grade to Inspection test per paragraph 3.14.
- B. The Contractor shall remove concrete formwork, trash, and debris prior to placing backfill.
- C. The Contractor shall backfill utility trench Excavations to the lines and grades shown on the Contract Documents.
- D. Trench sides shall be supported or shored as required to maintain safe working conditions and code requirements.
- E. The Excavations shall be kept free from water until pipeline and Utility Structure bedding, pipeline jointing, pipeline backfill and final backfill is completed.
- F. The Contractor shall place and compact pipe zone bedding and backfill below, around and above the piping to the dimensions shown on the Contract Documents. The Contractor shall:
 1. Shape pipe zone bedding to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
 2. Carefully compact pipe zone backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit.
 3. Coordinate backfilling with Utilities testing.
 4. Backfill voids located within the pipe zone backfill zone while as a result of installing and removing shoring and bracing with Pipe Zone Backfill Material.
- G. The Contractor shall place Pipe Zone Bedding Material to the plan cross section requirements evenly and carefully removing rock or other debris capable of damaging pipe. Place Pipe Zone Backfill material in lifts not exceeding eight (8) inches in depth and compact to specified densities to subgrade.
- H. The Contractor shall coordinate with other Utilities prior to pouring concrete so that the other Utilities may cross the concrete filled trench without obstruction.
- I. For Utility Structure bedding and backfill, the Contractor shall:
 1. Pass the Grade to Inspection test.
 2. Provide firm earthen foundation for all Utility Structures.
 3. Place and compact Utility Structure Bedding Material in accordance contract requirements.
 4. Place and compact Utility Structure pipe zone backfill at specified densities to subgrade in accordance with Contract Document requirements.

3.14 SUBGRADE AND GRADE TO INSPECTIONS

- A. The Contractor shall coordinate and schedule an inspection with the Engineer at the following
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times:

1. Upon completion of trench Excavation to the lines and grade shown in the Contract Documents, prior to pipeline bedding and backfill installation.
 2. Upon completion of all cut to fill grades and prior to any subsequent fill placement.
- B. The Engineer will conduct testing as appropriate to verify the soil firmness/stability at the foundation grade (see Drawing cross sections).
1. Test subgrade or grade surface in accordance with paragraph 3.18 FIELD QUALITY CONTROL/TESTING requirements.
 2. Should the testing or Engineer determine that the soils located at the required grades and Subgrades are firm/stable, then subsequent work shall be conducted.
 3. Should the Engineer determine that the soils located at the required grades and Subgrades are not firm/stable, then the Engineer will determine the necessary corrective measures. Corrective measures may include AUTHORIZED OVEREXCAVATION AND BACKFILL.

3.15 CONDUCT OF GRADING

- A. The Contractor shall grade the Subgrade area surfaces to conform to required finish grade contours, lines, and grades/elevations less the respective surfacing section depths so that the respective surfacing sections can be placed to required depths evenly and uniformly on top of the prepared Subgrade. Work shall include, but not be limited to:
1. Preparation of native material to receive backfill and fills
 2. Excavating and removal of native materials
 3. Providing various Imported Soil Materials
 4. Grading and compacting soils to the required Subgrade elevations
 5. Providing positive drainage at parking and staging areas being driven on, Subgrades, and other areas as necessary during and for construction. Positive drainage shall be accomplished by establishing grades as designed or by interim methods as necessary.
- B. The Contractor shall complete finish grading after installation of respective surfacing sections. Conform to required finish grade contours, lines, and grades.
- C. During construction, the Contractor shall maintain lines and grades including crown and cross-slope of Subgrade, uniformly grade areas to a smooth surface, free of irregular surface changes, comply with compaction requirements, and grade to cross sections, lines, and elevations required by Contract Documents.

3.16 CONDUCT OF COMPACTION

- A. The Contractor shall compact soil materials in maximum 8 (eight) inch lifts under all areas to not less than the following percentages of maximum dry unit weight according to ASTM D1557.
1. Gravel area Subgrades shall pass a proof roll test. The Contractor shall compact each layer of fill to 95 percent maximum dry unit weight.
 2. For the existing biofiltration swale located in the southern portion of the site, the Contractor shall compact the soils in Excavation to Subgrade conditions to 90% of maximum dry unit weight. In fill to Subgrade conditions, compact the fill to 90% of maximum dry unit weight. The Contractor shall hand rake these areas smooth prior to topsoil placement as described in Section 32 92 19 – Seeding.

3. For Utility Trenches and Structures, the Contractor shall compact pipe zone bedding and Utility Structure bedding aggregates at 90 percent maximum dry unit weight and pipe zone backfill aggregates to subgrade at 95 percent maximum dry unit weight.

B. The Contractor shall provide all water required for soil compaction.

3.17 TOLERANCES

- A. The Contractor shall uniformly grade areas within grading extents. The Contractor shall provide smooth finish surfacing within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades. Finish surfaces free of irregular surface changes and as follows:

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1. Gravel area finish grades and subgrades shall be shaped to required lines and grades within 0.50 inch above or below required elevations. The Contractor shall obtain the Engineer's subgrade approval prior to placement of gravel area section materials.

[5]

3.18 LINER SYSTEM

A. Preparation

1. Provide smooth, even subgrade. Provide a subgrade that is free of sharp projections, voids, particles 1-1/2 inches or larger in size and angular rocks, cobbles, roots, vegetation, debris, protrusions, groundwater and other deleterious objects.
2. Contractor shall provide Engineer of Record ample notification and opportunity to witness all subgrade preparation prior to liner placement, field trial seams and production seam testing. Contractor's Installer should fill out its own documentation to provide to the Engineer's Representative.
3. Field trial seam testing – trial welds: liner material. It is the responsibility of the Contractor and his Installer to perform and document all pre-installation and production testing of the geomembrane installation.
4. Liner material shall not be deployed:
 - a) During precipitation;
 - b) In the presence of excessive moisture as determined by the Engineer of Record;
 - c) In areas of ponded water;
 - d) In the presence of excessive winds (sustained winds greater than 25 MPH) or at the discretion of the Engineer of Record.
 - e) At temperatures above or below the Manufacturer's or Supplier's recommendations.
5. The Contractor is responsible for the following while the liner material is being deployed
 - a) Engineer of Record is contacted and provided adequate access to observe the installation.
 - b) Equipment is used in a manner that does not damage liner material.
 - c) Personnel working on liner do not engage in activities that could damage liner.
 - d) Smoking on the liner is prohibited.
 - e) Clamps and other metal tools are not tossed or thrown.
 - f) Liner material has had adequate time to acclimate to ambient temperature prior to welding.

- [5] g) The deployment method protects both the geomembrane component as well as the underlying subgrade.
- h) Adequate anchoring techniques are used to prevent uplift by wind.
- i) Anchoring techniques are used that will not damage the geomembrane component.
- j) Continuous sandbags are used along leading edges of the geomembrane to reduce wind flow under panels.
- k) Panels are deployed perpendicular to slope elevation contours.
- l) Generation of seams are reduced where possible.
- m) Liner material is protected in heavy traffic areas using methods approved by the Engineer of Record.
- n) Rubber tired ATVs are acceptable if specified wheel pressure limitation is specifically observed, and the Manufacturer's allowable wheel pressure and trafficking criteria is provided to the Engineer in writing.
- o) Liner key-in trench is filled when temperatures are coolest to reduce bridging of the geomembrane component, where practical.
- p) Material placed in anchor trenches are placed in uniform lifts, not to exceed 12 inches loose thickness and are compacted.
- q) Coordinate with Engineer of Record to allow in-place moisture/density tests to be taken in anchor trenches at the discretion of the Engineer's Representative. Compaction requirements for anchor trench backfill are similar to pipe zone bedding requirements (See Paragraph 3.16.A.3).
- r) Slightly rounded corners are provided in anchor trenches.

[5] B. Pre-Installation testing

1. Contractor shall provide Engineer of Record ample notification and opportunity to witness all field trial seam and production seam testing. Contractor's Installer should fill out its own documentation to provide to the Engineer's Representative.
2. Field trial seam testing – trial welds: liner material. It is the responsibility of the Contractor and his Installer to perform and document all pre-installation and production testing of the liner installation.
 - a) Prior to turf component welding, Engineer of Record shall be given ample notification and the opportunity to observe and document the following:
 - 1) Liner welding apparatus are tested;
 - 2) at daily start-up; and,
 - 3) immediately after any break; or,
 - 4) anytime the machine is turned off for more than 30 minutes.
 - b) Procedures:
 - 1) If at any time, the Installer or Engineer of Record believes that an operator or welding apparatus is not functioning properly, a Field Trial Seam Test must be performed.
 - 2) Any dispute concerning proper installation techniques, or the proper

- [5] function of welding equipment shall be resolved by the Engineer's Representative.
- 3) The trial weld must be allowed to cool to ambient temperature before testing.
- c) Field Seam Test Failure:
- 1) Unacceptable locus-of-break codes per their description in ASTM D6392:
- a) Hot Wedge: AD and AD-Brk>25%.
- b) Extrusion Fillet: AD1, AD2, AD-WLD (unless strength is achieved)
- 2) There will be no apparent weld separation (i.e., greater than 25% of weld width).
- d) The independent testing laboratory strength tests must:
- 1) Meet the manufacturer's specifications for the sample sheets; or
- 2) Percentage of the manufacturer's parent sheet strength as determined by the manufacturer.
- e) For dual-track fusion welds, both sides (the inner and outer weld) must meet the minimum requirements for a satisfactory peel test.
3. Additional Field Seam Testing Requirements – Liner
- a) A trial weld shall also be performed prior to welding tie-ins.
- b) The trial weld sample must be 3 feet long and 12 inches wide, with the seam centered lengthwise.
- c) If a welding apparatus exceeds 5 hours in the second half of the day, another trial seam must be performed.
- d) Minimum required number of specimens per trial weld:
- 1) Two coupons for shear and two coupons for peel.
- 2) Both the inner and outer welds of dual track fusion welds:
- a) Must be tested for each peel test coupon; or
- b) Additional coupons will be required.
4. CQA documentation of trial seam procedures will include the following:
- a) The names of the seaming personnel;
- b) The name of the welding technician;
- c) The welding apparatus number, time, date;
- d) Ambient air temperature; and
- e) Welding apparatus temperature.

[5] C. Installation – PVC Liner

1. Place base geotextile prior to installation of PVC liner.
2. Place PVC liner over prepared surface and geotextile to ensure minimal handling. Install in compliance with manufacturer's written instructions. Install liner in a relaxed condition, free

- [5] from stress and tension.
3. All seams shall have air channel testing performed in accordance with ASTM D7177. Seams shall be pressurized to 30 pounds per square inch and held at this pressure for 5 minutes. Engineer shall be present during all testing.
 4. For approved PVC material, select seams shall be tested in accordance with ASTM D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods at the Engineer's discretion.
 5. PVC liner shall be welded to PVC well casings where wells are proposed to penetrate the liner.
 6. Liner Repairs: Repair tears, punctures, and other imperfections in PVC liner and seams using patches of liner material, liner-to-liner bonding materials, and bonding methods in accordance with manufacturers' written instructions. Apply bonding solvent or weld to contact surfaces in accordance with manufacturers written instructions.
 7. Protect installed liner. Repair or replace areas of liner damaged by scuffing, punctures, traffic, rough subgrade, or other unacceptable conditions. Place geotextile over PVC liner following acceptance by the Engineer.

[5] D. Installation – LLDPE Liner

1. Place base geotextile prior to installation of LLDPE liner
2. Place LLDPE liner over prepared surface and geotextile to ensure minimal handling. Install in compliance with manufacturer's written instructions. Install liner in a relaxed condition, free from stress and tension.
3. All dual track seams shall have air channel testing performed in accordance with ASTM D5820.
4. For approved LLDPE material, select seams shall be tested in accordance with ASTM D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods at the Engineer's discretion.
5. LLDPE liner shall be mechanically sealed to PVC well casings where wells are proposed to penetrate the liner. Mechanical seal shall consist of butyl sealant on the PVC casing, wrapped LLDPE membrane around the butyl sealant, and securing with a pipe strap/clamp. Seal shall be water tight. Alternate mechanical seals may be used if approved by the Engineer.
6. Liner Repairs: Repair tears, punctures, and other imperfections in LLDPE liner and seams using patches of liner material and bonding methods in accordance with manufacturers' written instructions.
7. Protect installed liner. Repair or replace areas of liner damaged by scuffing, punctures, traffic, rough subgrade, or other unacceptable conditions. Place geotextile over LLDPE liner following acceptance by the Engineer.

[3] 3.403.19 FIELD QUALITY CONTROL/TESTING

- A. General: The Contractor shall coordinate, schedule, notify and allow the Engineer to inspect and approve grades, Subgrades and fill/backfill layers before further construction work is performed. The Engineer and/or their testing agent shall perform field density tests in accordance with ASTM D 6938 as applicable or a proof-roll test may be required at all grades at

the Engineer's discretion. The Contractor shall provide samples of material 2 weeks prior to planned use for testing by ASTM D 1557. If fills are below specified density, the Contractor shall provide additional compaction for retesting. If additional testing is required due to failure of areas tested, the Contractor shall pay for such retesting.

- B. Utility Trenches and Backfill Testing: The Contractor shall coordinate, schedule, notify and allow the Engineer and/or their testing agent to conduct in-place density tests per D 6938, minimum of one (1) field density test for every 100 lineal feet/ 1 vertical foot of trench.
- C. Utility Structure Backfill Testing: The Contractor shall coordinate, schedule, notify and allow the Engineer and/or their testing agent to conduct in place density tests per ASTM D 6938, minimum of two per Utility Structure located within the pipe zone backfill.
- D. Cut to fill grades: A proof-roll test shall be required at all gravel area cut to fill grades prior to the placement of subsequent fills in the presence of the Engineer.
- E. Proof Roll Test: The Contractor shall notify the Engineer a minimum of two calendar days prior to proof roll test shall meet the following requirements:
 - 1. Completely proof-roll the Subgrade in one direction and repeat proof rolling in direction perpendicular to first direction. Maximum vehicle speed shall be 3 mph.
 - 2. Proof-roll with a fully-loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 - 3. Should the surface of the proof roll tested area deflect and fail the test and/or reveal a Soft Spot, the Contractor shall provide corrective measures as directed by the Engineer and then retest area until the proof roll test is acceptable.
 - 4. Should the Subgrade surface area not deflect, the proof roll test will be considered acceptable and subsequent fill/embankment or paving work shall commence.

[3] 3.143.20 PROTECTION

- A. The Contractor shall protect graded areas from traffic and from becoming excessively wetted or eroded due to weather conditions.
- B. The Contractor shall prevent and protect the existing native soil grades from deterioration. Deterioration of prepared or installed work areas, as a result of, but not limited to, scheduling and sequencing of work, construction and equipment operations, working hours and weather shall not be the basis for additional Authorized Overexcavation and backfill work.

[3] 3.123.21 MAINTENANCE

- A. The Contractor shall repair and reestablish grades to specified tolerances where installed surfaces have become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions at no additional cost to the Port. Remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- B. The Contractor shall recondition compacted areas, where completed compacted areas are disturbed by subsequent construction operations, deterioration or adverse weather, repair prior to further construction with no additional cost to the Engineer.

[3] 3.133.22 DISPOSAL

- A. The Contractor shall stockpile all unsuitable soil. Further handling of the material will be at the direction of the Engineer and will be in accordance with Specification 02 60 00 and 02 61 00 if off-site disposal is necessary.

END OF SECTION
